JOURNAL *of* EDUCATIONAL RESEARCH

Volume XIV NOVEMBER, 1926 Number 4

A STUDY OF PUPIL FAILURES AND SUBJECT FAILURES IN CHICAGO[1]

DON C. ROGERS
Principal, Smyth School, Chicago

Chicago is in the throes of educational growing pains, perhaps unprecedented in its history. The city population now exceeds three millions, and the public-school enrollment in all departments is approaching a half-million students. The city population has increased 12 percent in the past ten years, but the number of school children has increased 48 percent. "Ninety-one more school children since yesterday" is a slogan which is true, on the average, for every school day of the past five years—a growth of 18,150 in annual enrollment since 1920. There has been a 25-percent turnover in administrative personnel—seventy-five new principals in the past two years. Thirty-six new school buildings now under construction will be opened during 1926, but there will still be fifty thousand too few seats at the end of the year. Several of the elementary schools have been reorganized according to the platoon scheme, and a program has been launched which will ultimately establish seventy-five junior high schools.

This partially describes the city-wide educational situation. Locally—that is, within each school—there is a myriad of activities over and beyond the traditional subjects. Almost any school building is likely to include the following: hundreds of children to be fed in penny lunchrooms; scores of children to be given baths in school bathrooms; free textbooks to be handled (the average elementary school has almost fourteen hundred pupils);

[1] This is a paper, supplemented by some later data, given before the Educational Research Association at its Washington meeting, February, 1926.

open-air rooms, rooms for subnormals, and opportunity rooms to be supervised; auditorium and gymnasium classes; evening school on certain days of the week and community-center social activities on other days of the week. All of these are in addition to the regular school work so it is apparent that a Chicago principal has his hands full.

The principals have a voluntary organization known as the Chicago Principals' Club. About three years ago the Principals' Club decided to establish a central research department at its headquarters, to which the principals might turn for assistance in the problems growing out of the multiplicity of activities heretofore described, a sort of clearing house within their own organization. Studies have been made in many fields—for example, supervision, school legislation, course of study, school publicity, school finance, and more recently a study of pupil and subject failures. My present report deals with some of the findings on pupil failures and subject failures. The figures concerning failure are considered under two aspects: first, average percent of failure; and second, variability in practice regarding failures.

Average Percent of Failure

The 272 Chicago elementary schools failed to promote 32,549 of their pupils in January, 1925, an average of 10.3 percent of their total membership. Assuming that these children have to repeat the work of a semester, this means that in Chicago the equivalent of 27 elementary schools, with 27 principals, 733 teachers, and a corps of engineer-custodians are kept busy full time just to care for "repeaters." Among the 24 high schools it was found that an even higher percent of work (12.4) was unsatisfactory. If the high-school students repeated or took other work, this would mean that the equivalent of three high schools would be kept open, and three principals, 250 teachers, and the janitorial corps in charge of the operation of the plant would be kept on the job, because of the failures in high school. Are these failing rates too high, just right, or too low?

Variability of Practice among the Individual Schools Regarding Failure

High-school subject failures.—In high school the range of practice in subject failures was tremendous. Of the practical-arts pupils of grade X-B, 4.0 percent were failed; of the X-B mathematics pupils, 20.5 percent were failed—five times as many failures in mathematics as in practical arts in the same grade. In IX-B Latin, 24.5 percent of the students were failed (1 out of 4); in XII-A Latin only 0.9 percent were failed (1 out of 111). These and other figures are given in Table I.

TABLE I. PERCENT OF SUBJECT FAILURES IN THE CHICAGO SENIOR HIGH SCHOOLS, JANUARY, 1925*
(24 high schools—59,218 students)

Subject	Grade IX		Grade X		Grade XI		Grade XII		Four-Year Weighted Average
	B	A	B	A	B	A	B	A	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
History	17.0	2.8	9.5	8.7	7.9	8.5	5.5	3.2	7.2
Practical arts	10.7	7.0	4.0	2.7	4.1	2.8	5.1	3.0	7.3
Science	12.6	10.0	11.2	9.6	12.9	11.1	7.3	5.4	11.4
English	15.3	11.8	13.7	8.8	11.4	6.5	5.7	2.3	11.8
Commercial	17.1	13.3	8.9	4.3	7.5	13.5	3.5	3.7	12.4
Modern language	16.0	16.0	12.6	10.4	6.3	5.1	3.0	2.3	13.1
Mathematics	16.5	18.6	20.5	16.4	17.9	17.2	10.7	2.7	17.0
Latin	24.5	21.7	17.7	15.1	8.0	9.2	3.0	.9	18.6
Weighted average all subjects	15.4	13.7	12.8	9.5	10.3	8.3	5.6	3.3	12.4

* Table I obtained from E. E. Keener, director, Bureau of Instructional Research, Chicago public schools.

Elementary-school failures.—The range of school percents was very wide. In one school only 0.4 percent of the membership failed (that is, 1 out of 250); in another school, 35.2 percent of the membership failed (more than 1 in 3). Table II gives the details. The variation among schools in regard to subject failure may be inferred from data concerning a single subject and grade—arithmetic in VI-A. In one school no VI-A pupils failed in arithmetic, while in another school 63 percent

failed. The range of the middle half of the schools extended from 8 percent of failure to 23. The mean percent was 16. Table III shows data for six schools both as to failure and as to results in the Woody-McCall Mixed Fundamentals Test—this test having been given shortly before the end of the semester in 268 schools. Since 16 percent of the VI-A pupils were failed

TABLE II. PUPIL FAILURES IN THE CHICAGO ELEMENTARY SCHOOLS, JANUARY, 1925

(272 elementary schools—317,715 pupils)

Percent Failed	Number of Schools	Percent Failed	Number of Schools
(1)	(2)	(3)	(4)
35	1	12	22
30	1	11	18
27	1	10	18
26	1	9	17
25		8	22
24	3	7	32
23	1	6	19
22		5	19
21	2	4	21
20	2	3	10
19	6	2	6
18	3	1	1
17	5		1
16	11		
		Total	272
15	7	Median	9.3
14	10	Mean	10.3
13	12	S. D.	5.3

in arithmetic by their teachers, the 16-percentile on the distribution of Woody-McCall test scores was called the "failing point." Those pupils whose scores on the Woody-McCall test fell below the 16-percentile—a score of less than 21—were said to have "failed on the standardized test."

One might imagine that the school ranking highest in the test would have few pupils failed by the teachers; and that the school ranking lowest on the test would have many pupils failed by the teachers. But when the 268 cases were correlated, a zero

coefficient resulted. The selected samples in Table III give some indication that a coefficient of any significance could hardly be expected. Here, then, is undoubted evidence of variability in practice among the schools. There is no consistent uniform

TABLE III. DATA ON SIX SCHOOLS, SHOWING VARIANCE IN SCHOOL PRACTICE REGARDING VI-A ARITHMETIC FAILURES[a]

School	School Rank on Woody-McCall Test	Percent Failing on Woody-McCall Test[b]	Percent Failed by the Teachers
(1)	(2)	(3)	(4)
M	1	0	0
N	264	54	0
R	2	0	11
S	268	71	11
P	39	0	39
Q	260	52	2

[a] Data obtained from a study in collaboration with E. E. Keener, director, Bureau of Instructional Research, Chicago public schools.

[b] That is, these pupils scored less than 21.

TABLE IV. DATA ON PERCENT OF PUPIL FAILURES BY SCHOOLS

	1925	1926
Mean	10.3	7.8
Standard deviation	5.3	4.7
Range		
Maximum	35.2	19.6
Minimum	0.4	0.0

practice in the Chicago elementary schools either as to pupil failures or as to VI-A arithmetic subject failures.

A reaction, since this study of failures was sent out to the Chicago schools, is already in evidence, as Table IV illustrates. Two significant interpretations are possible from Table IV: (1) Fewer pupils were failed this year than last year, for the

1926 mean percent is 2.5 smaller than the 1925 mean. Roughly, this indicates that nearly eight thousand fewer elementary-school children were failed. (2) The amount of failure among the schools was more uniform this year than last. In 1926 the schools clustered more closely around the central tendency than in 1925. This is shown by the smaller standard deviation and

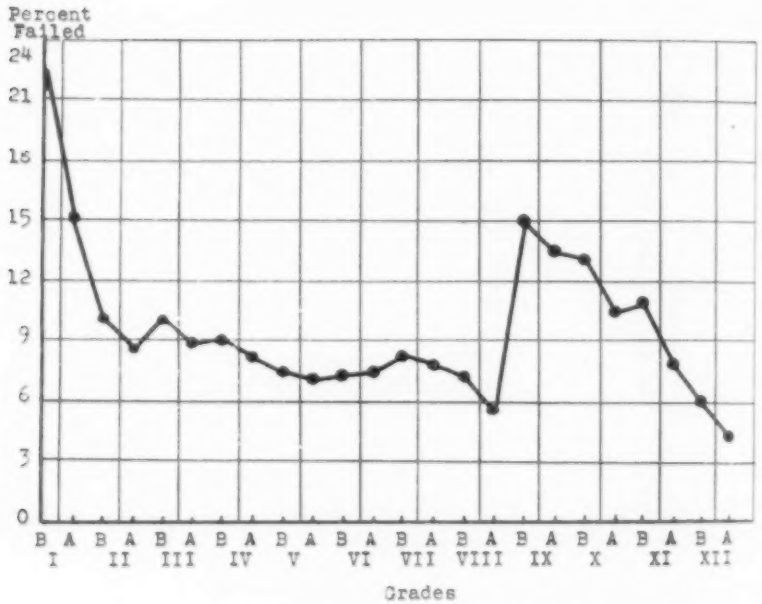

FIGURE 1. PERCENT OF SUBJECT FAILURES BY GRADES —JANUARY, 1925

the contracted range. The data do not reveal whether this reduction in amount of failure and this greater conformity to the group practice are the result of careful study of the causes of failure and of the promotional machinery supplemented by remedial measures, or whether they are simply the result of arbitrary fiat. A few instances, known personally to me, resulted from concrete remedial and supervisory attention on the part of the principals.

In Figure 1 another significant condition is shown.[2] The base line represents grades I to XII, each in two sections, B for beginners and A for advanced. At the left is represented the percent of failures. These data are not pupil failures but subject failures, even in the elementary grades, and thus they are probably comparable throughout. Note the tremendous jump between VIII-A and IX-B. I find this situation easily explained, but I have yet to find a person who was willing to *justify* it. It is generally believed, however, that this condition exists all over the country and is not local to Chicago. In fact, data at hand indicate equal variability in the case of one large city and higher mean failures in the case of two cities.

A number of pertinent questions arises from a study of Figure 1: (1) Why should such a "break" occur between VIII-A and IX-B, namely, four and two-thirds times more failure in IX-B than in VIII-A, although in point of time but five school months apart? (2) Why should the high-school average of failure be any higher than the elementary? The high-school average shows that 12.4 of the high-school work is not done satisfactorily. Only 10.3 of the elementary work is regarded as unsatisfactory—this in spite of the fact that the elementary-school figures are increased, perhaps unduly, by failures in the first grade where many pupils from foreign-language-speaking homes are struggling with English, and by non-promotions in the first grade because some pupils, admitted at the compulsory school age, have been present but a month or two. If first-grade data are omitted, then the high-school failing rate is 50 percent higher than the elementary rate. (3) Will the new junior high schools "bridge the gap" between VIII-A and IX-B? The future holds the answer to this question.

Let me call attention to the causes for failure listed in Table V. The principals of the schools which failed the largest and the smallest percent of their pupil membership, cooperated

[2] This figure was devised in collaboration with E. E. Keener, director, Bureau of Instructional Research, Chicago public schools.

TABLE V. CAUSES OF FAILURE AND SUCCESS

REASONS FOR LARGE PERCENT OF FAILURES (Advanced by the principals of twenty-one schools whose failure amounted to 23 percent of their school membership)	REASONS FOR SMALL PERCENT OF FAILURES (Advanced by the principals of seventeen schools whose average failure amounted to 3 percent of their school membership)
1. *Poor Administrative Conditions:* Transfer back and forth from parochial schools Half-day sessions only Irregular attendance, truancy Transiency or turnover (as high as 50 percent in a year) Over-age and late entry Faulty administrative machinery, for example, not permitted to arrange homogeneous groups Building operations, namely, additions under construction No provision for individual differences possible	1. *Careful Supervision:* High degree of teacher-principal cooperation Much blackboard and other visual work Much drill material Review classes Check up of progress made on teachers' programs High standards and exactions Achievement tests to measure progress (In one case principal files these for later use in checking progress of individual pupils)
2. *Poor Health Conditions:* Undernourishment, irregular meals, no breakfasts Interruptions due to sickness, physical defects, etc. Listlessness, due to late hours, movies, and so on	2. *Good Teaching Corps:* Individual attention given to pupils Willingness to work after hours Encourage child initiative School spirit
3. *Poor Environmental Conditions:* Poor homes, rooming-house area, parental ignorance Lack of good parental influence, no home discipline Parents working, children get no attention Bad social-moral surroundings Poverty No cooperation of parents Truant officers work nights	3. *Good Administrative Conditions:* Classification of pupils into homogeneous groups Care of individual differences Careful grading, early in term Give the child benefit of any doubt, in promotions Regular attendance of pupils No crowded conditions Little transfer of pupils "Our job to get them through, that is what we are paid for."
4. *Low Mentality of Pupils:*	4. *Good Health Conditions:* Stress on health education Clean surroundings Examinations by Child Study Department Plenty of fresh air
5. *Race and Nationality:* Negroes, newly arrived in the city, little or no schooling, no background Mixed nationalities Language trouble, English at school, alien tongue at home	5. *American Family Stock or Other High-Grade Nationality:* No language difficulties Superior mentality Good home surroundings Cooperation of parents School district homogeneous
6. *Teaching Conditions:* Holding to high standards of achievement Mediocre teaching corps	

in this statement of causes. In this table are given reasons for the small percent of failures as well as the supposed causes for large percents of failures.

What are the implications from this study? Should we examine more critically our teaching methods, especially in high schools? Does our administrative machinery need revision? Are we in need of reorganized supervisory methods and standards? Do we need some definite criteria for failure? Finally, are we in need of curriculum revision? This latter is highly probable; so much so, in fact, that the School Board of Chicago recently authorized a curriculum survey. It has set up an appropriation of $25,000 and authorized the release of eighteen teachers for full-time participation in the survey. This is part of the great cooperative study of the American curriculum launched by the National Educational Association.

In closing, let me point out that the situation in Chicago is not dissimilar to that in other great cities. In fact, as has already been said, data which have come to my attention show a higher mean failing rate in two cities, and an equal variability in another. In Chicago we have simply discovered that we have the problem of failure and are seeking its solution.

SOME CONSIDERATIONS IN BUILDING SALARY SCHEDULES

ARTHUR B. MOEHLMAN
University of Michigan

After making a series of studies of teachers' salaries,[1] the writer came to the conclusion that the method—most popular after the war—of starting with the cost of living as a base might be open to considerable criticism from the standpoint of economic theory. The method of ascertaining the cost of living for teachers was laborious and constantly assailed because of a lack of uniform opinion as to what constituted a living wage at the teacher's level.[2]

The work of Moore, at Columbia, on the *Law of Wages*[3] and the tendencies shown in Burgess' excellent analysis of the *Trends of School Costs*[4] strengthened the feeling that some other method might be employed in developing schedules of teachers' salaries that could be easily and quickly used by different communities and which would not be open to the criticisms offered against the first method. Moore concluded, after a period of intensive research, that wages are an expression of the value of service rendered to society by labor. The minimum wage would therefore be an expression of the value of the service of the least competent members in the group. Wages tend to increase directly with the value of the service rendered. The difference between the wages of any group and the minimum wage for unskilled labor must be credited to some special service or utility rendered society by the group. Burgess, well acquainted with the assumptions of Moore, found only a slight correlation between the cost of living and teachers' salaries and a closer agree-

[1] Detroit Survey Reports. *Teacher Salary Surveys.* Nos. 1, 2, and 3 (1919-23).

[2] "A Survey of Teachers' Salaries in Detroit." *Detroit Research Bulletin,* 1920. pp. 29-36.

[3] Macmillan Company, New York, 1911.

[4] Russell Sage Foundation, 1920.

ment between salaries and wages of labor.[5] A study of conditions over practically the same period in Detroit showed the same general tendencies. Salaries of both men and women teachers were in close agreement with labor wages.[6]

From a practical standpoint the minimum wage, although a measure of the regard in which society holds the least efficient service, is, in the last analysis, closely correlated with the cost of existence. In different parts of this country the same service brings varying returns. The cheap Oriental labor on the west coast, the Negro in the south, the southern European emigrant in the east, and the native American receive different money wages for the same type of service. While the factor of supply and demand plays a large part, it is also true that the ability to exist determines in some measure the return for service. The native American cannot live upon the wages paid Oriental and Mexican labor in the west. He has, therefore, sought other fields where his services will enable him to live according to the scale he has developed. Dollar-a-day labor would not attract the American, but the Oriental will thrive upon it and ultimately achieve economic independence upon his scale of living.

While neither Moore nor Burgess deny that cost of living enters into basic wage, they apparently do not consider it of vital or paramount importance in the determination of wages. As we go up in the economic scale from the unskilled to the skilled and finally to the highest trained professions we find that, upon the average, there is a distinct increase in the return for services. The basic, or minimum wage, in each group is higher than the return to the unskilled labor and the upper limits may be three or more times higher. For each level there is a different standard of living and therefore a higher cost of living. The minimum wage at any specific time may be above or below this point, but will probably tend, over a period of time, to be in agreement.

[5] The coefficient of correlation between the wages of unskilled and skilled labor, according to Moore was 0.775 (Pearson) while that between the wages of unskilled labor and the cost of living was only 0.306 (*Op. cit.*, pp. 33-41).

[6] Moehlman, A. B. *Public Education in Detroit.* Vol. II. Bloomington Illinois, Public School Publishing Company, 1926 (on the press).

During the critical period from 1915 to 1920, the salaries received by teachers did not mean that they were unable to *exist* but rather that they could not continue to live upon the plane demanded of them professionally or socially. Thousands consequently left the teaching profession for other fields where the return for service was in accord with their standard. The factor of supply and demand began to operate, and there was a fairly general movement of salaries upward until the required, or desired, point was reached. Teachers who had gone into other service returned seeking their old positions, the registration in normal schools and colleges of education began to increase again, until in 1924, these institutions were able to set higher standards for admission than before.

The close relationship between cost of existence and the wages of labor is apparent to anyone who has seriously studied the problem. Labor wages are very sensitive to changes in living prices, if the wage goes below the point where it is impossible to exist the laborers will seek other fields. Demand for labor will prevent such condition from obtaining over any considerable period. On the other hand, the basic truth of Moore's findings must not be overlooked or minimized.

Wages are determined by a number of variables of which the cost of living and the social value of labor's product tend to be dominant. Since this is true, the problem was to ascertain whether there was a definite enough relationship between the wages of labor and the salaries of teachers to establish an index upon which salary schedules might be easily and rather uniformly built. The wages of labor form a rather sensitive barometer because this group is generally close to the line of bare existence. Labor wages react first to any grave fluctuations in price levels, while teachers' salaries tend to be the last to move either upward or downward. If such relationship could be verified an index, built upon labor wages, should furnish a rather reliable method.

The problem was to determine an index which would furnish a convenient instrument by which a salary schedule might be quickly arranged in any community. The questionnaire method

was employed, and requests for essential data were sent to forty cities having more than one hundred thousand population and to one hundred cities with populations of less than one hundred thousand. The request met with the average degree of success, for of the forty questionnaires sent to the larger cities, twenty were filled out and of this number the replies given on fifteen

TABLE I. RELATION OF UNSKILLED TO SKILLED LABOR WAGE

Number of Cases	Unskilled Labor	Skilled Labor
(1)	(2)	(3)
2	100	250
1	100	246
1	100	229
8	100	200
1	100	196
1	100	189
1	100	185
1	100	183
1	100	177
2	100	175
1	100	172
2	100	167
1	100	163
1	100	155
1	100	150
1	100	144
1	100	122

Median.....189
Mean.....189
Mode.....200
Range.....122 to 250

could be used. Twenty-five of the smaller cities replied; nineteen of the questionnaires were finally used. The others were discarded because the replies did not completely give the desired information. The index was used to determine relationship with the wages of unskilled labor considered as 100, and all data were translated in relation to this index. The relation between skilled and unskilled labor in cities of less than one hundred thousand population (15 cases) showed a range from 155 to 250. The

median, mean, and mode were all 200. In the case of the larger cities (12 cases) the range was from 122 to 200; the mode, 200; and the mean, 174. These data are combined in Table I.

In considering both groups of cities as a single distribution the median changed to 189, the mode remained at 200, the mean was 189, and the range from 122 to 250 points. The wide

TABLE II. RELATION OF WAGES OF UNSKILLED AND SKILLED LABOR AT FIVE-YEAR INTERVALS

Year	Unskilled	Skilled
(1)	(2)	(3)
1841	100	170
1845	100	169
1850	100	166
1855	100	168
1860	100	162
1865	100	166
1870	100	180
1875	100	183
1880	100	190
1885	100	180
1890	100	177
1895	100	176
1900	100	176
1905	100	179
1910	100	186
1915	100	180
1920	100	161
Median		179
Mean		175
Mode		180
Range		161-190

range raised a doubt as to the conclusive validity of these results, because they represent only samplings of certain sections of the country, including several high labor centers such as Detroit, Cleveland, and San Francisco. Recourse was had to the compilation made by Burgess on the wages of unskilled and skilled labor since 1841.[7] His data were taken at five-year intervals and translated into the index previously mentioned. The result

[7] *Op. cit.*, p. 71. Table VIII.

showed a median of 179, a mean of 175, a mode of 180, and a range from 161 to 190, or only 29 points, as presented in Table II.

A comparison of these data shows what was expected. There is a closer relationship in the findings of Burgess than in the present study due to a wider sampling. It does appear, however, that the probable relationship of unskilled to skilled labor wages is as 100 is to 180. Table III shows the comparison of these findings with those of Burgess.

TABLE III. COMPARISON OF PRESENT STUDY WITH THAT OF BURGESS

	Small Cities	Large Cities	All Cities	Burgess
(1)	(2)	(3)	(4)	(5)
Median	200	179	189	179
Mean	200	174	189	175
Mode	200	200	200	180
Range	155–250	122–200	122–250	161–190

The next step was to determine the relationship between the minimum salary paid teachers and the wages of unskilled labor. In Table IV these data are presented for teachers of two and four years of professional training beyond the high school. The median for two years of training was 151; the mode, 150; the mean, 149; and the range, from 100 to 200. In the case of teachers with four years of training the median was 188; the mode, 200; the mean, 192; and the range, from 129 to 281. The median and mode in the smaller cities were greater than in the larger cities, particularly those situated near some metropolitan center like Detroit. The desire of teachers to be in the larger cities has forced the smaller places, so situated, to offer greater inducements, and this probably accounts somewhat for the wide range.

The same operations were performed in respect to maximum salaries paid teachers of two and four years of professional training. The relation of the maximum salaries of teachers with

two years of training to unskilled labor gave a median of 220, a mode of 200, a mean of 233, and the range from 147 to 380 or 233 points. Where the teachers had had four years of training the median was 300, the mean 301, the range from 178 to

TABLE IV. RELATION OF TEACHERS' MINIMUM SALARIES TO UNSKILLED LABOR FOR ALL CITIES

Number of Cases	Two Years of Professional Training	Number of Cases	Four Years of Professional Training
(1)	(2)	(3)	(4)
2	200	1	281
1	190	1	275
1	172	1	259
2	171	1	257
2	167	1	250
2	166	1	234
1	164	1	221
3	152	1	208
6	150	4	200
1	149	3	194
1	140	1	188
1	135	2	187
2	133	2	180
1	130	2	177
1	126	1	170
1	125	1	169
3	120	2	160
1	111	1	157
1	100	1	152
		3	150
		1	140
		1	129
33	.....	33	.....
Median.....151		Median.....188	
Mean.....149		Mean.....192	
Mode.....150		Mode.....200	
Range.....100–200		Range.....129–281	

395, while there was no clearly defined mode. The explanation of breadth of range noted above holds true for the maximum as well as minimum salaries. These data appear in Table V.

A summary of the data so far is given in Table VI. Judged

TABLE V. RELATION OF TEACHERS' MAXIMUM SALARIES TO UNSKILLED LABOR FOR ALL CITIES

Number of Cases	Two Years of Professional Training	Number of Cases	Four Years of Professional Training
(1)	(2)	(3)	(4)
1	380	1	395
1	316	1	390
1	288	1	385
1	272	1	383
1	265	2	380
1	257	1	371
1	254	1	367
3	250	2	360
1	246	1	357
1	242	2	333
1	241	1	324
1	240	1	307
1	229	1	301
1	222	1	300
1	221	1	285
1	220	1	283
3	208	1	280
7	200	1	266
1	192	1	255
1	188	2	250
1	180	1	242
1	155	1	241
1	152	1	240
1	147	1	236
		1	233
		1	229
		1	215
		1	210
		1	178
34	.....	33	.....

Median	220	Median	300
Mean	233	Mean	301
Mode	200	Range	178–395
Range	147–380		

by the medians, the minimum salary of teachers with two- and four-years training beyond the high school would be 151 and 188, respectively, in relation to unskilled labor. Skilled labor, the Burgess median, would be 179 while the maximum salaries of

teachers would be 220 and 300, respectively, with two and four years of training. The wide range in the case of minimum salaries for teachers of four-years training, together with the findings of Burgess, lead to the belief that 188 is too high. Competition of the small cities located near large cities has tended to distort this relationship so far as teachers' salaries are concerned. This index might more properly be set at 175 which probably expresses a truer relationship, as will be noted later in the schedule built upon this basis. Again, 180 seems to express better the relationship between unskilled and skilled labor than does 179 (see Table III). No change is suggested in the index figures for the maximum. In the fifth column is presented the suggested index relationship of teachers' salaries in respect to unskilled labor.

TABLE VI. RELATIONSHIP OF LABOR WAGES AND TEACHERS' SALARIES

	Median	Mean	Mode	Suggested Relationship
(1)	(2)	(3)	(4)	(5)
Unskilled labor	100	100	100	100
Teachers' salaries—minimum:				
Two-years training	151	149	150	150
Four-years training	188	192	200	175
Skilled labor[a]	179	175	180	180
Teachers' salaries—maximum:				
Two-years training	220	233	200	220
Four-years training	300	301	.....	300

[a] Burgess, *op. cit.*, p. 71.

Some of the significant trends developed by these data may be expressed as follows:

1. The minimum salaries of elementary teachers with two years of training are higher than the wages of unskilled labor.

2. The minimum salaries of teachers with four years of training are higher than the return to skilled labor.

3. The maximum salaries of teachers with two years of training are higher than the return to skilled labor and more than double the return to unskilled labor.

4. The maximum salaries of teachers with four years of training are higher than the return to skilled labor and triple the return to unskilled labor.

In making schedules of teachers' salary in individual communities many factors are involved. There is the pressure from the teachers, modified in most cases by the reaction of the board of education, so that in many cases the final result is a fairly even compromise between the two views.[8] If either view dominates the result would be out of proportion to the general trend. In other cases the state legislature may have set a schedule for certain classes of cities, in which other qualifying local conditions are ignored.[9] The presence of a strongly organized faction with political power may also be reflected in the schedule.

Small communities within reasonable distance of a metropolitan center, but outside of the high labor area, may be forced to offer extra inducements to compete against the city.[10] Backward or progressive communities will reflect their opinion of the value placed upon the school program through the salary schedule. The factor of supply and demand may be the determinant at any particular period. Considering carefully the presence of these and other variables, it is safe to assert that, over a period of years, the schedule of teachers' salaries will be the measure through which the community expresses itself in respect to the value placed upon the work of the teachers.

In so far as these data have conclusive validity, and in light of the significant trends and relationships shown, it is possible to set up certain hypotheses in respect to teachers' salaries in terms of the workings of definite economic laws.[11] Moore's

[8] Rockford, Illinois, is an exception. Here the teachers' schedule was adopted *in toto*. It is one of the most peculiar schedules in use.

[9] Rochester, New York.

[10] Cities within 75 miles of Detroit are so affected.

[11] These conclusions will probably hold true over a period of years, but might be affected somewhat by unusual conditions, such as the late war period.

Law of Wages if applied to teachers' salaries would give us the following principles and certain corollaries:

Basic relative salaries paid to teachers will tend to vary directly with ability. Initial ability is determined by the amount of training.

The absolute salaries paid to teachers will tend to vary directly with the valuation placed by society upon such service.

1. The basic salary for any community will tend to be somewhere between the actual value of a teacher's service, conditioned by the law of supply and demand, and the community's evaluation of such service and its ability to pay.

2. The minimum teacher's salary will generally tend to be above that paid unskilled labor and will vary directly with the amount of training.

3. The maximum salary paid to teachers will probably be somewhere between the actual value of a teacher's service, conditioned by the law of supply and demand, the community's ability to pay, and its willingness to pay.

4. The maximum wage will tend, in general, to be above that paid skilled labor but will vary directly with efficiency and training.

5. Salaries generally tend to increase directly with the amount of training, in so far as training is an initial measure of teaching efficiency.

6. Teachers' salaries will tend to rise rapidly during a period of prosperity following increased returns to labor.

7. Teachers' salaries are the last to fall during periods of industrial depression.

The purpose of this investigation was to discover an index which could be used as a convenient and effective starting point in schedule-building. Using the suggested index in Table VI as a base let us construct such a salary schedule and then compare it with the actual schedule in operation under the same conditions:

	INDEX
Unskilled labor	100
Teachers' Minimum Salaries:	
Two-years preparation	150
Four-years preparation	175
Teachers' Maximum Salaries:	
Two-years preparation	220
Four-years preparation	300

If the average daily wage to unskilled labor was $4.66, that of the beginning teacher would be $7, or $140 per school month. The initial salary for four years of training would be $8 or $160 per school month. The maximum salary of teachers with

TABLE VII. PREPARATION-DEVELOPMENT-MERIT TYPE

(Monthly Salary)

Experience in Years	Two Years of Training in a Recognized Normal School	Two Years of Training in a Recognized Normal School Plus One Year of Collegiate or Advanced Normal Work	Four Years of Normal or Collegiate Training, at Least 24 Hours of Which Shall Be Professional Training with A.B. or B.S.E. Degree	Five Years of Collegiate Training, at Least 40 Hours of Which Shall Be Professional Training with M. A. or M.S.E. Degree	Six Years of Collegiate Training, at Least 50 Hours of Which Shall Be Professional Training	Seven Years of Collegiate Training, at Least 60 Hours of Which Shall Be Professional Training with Ph.D. or Ed.D. Degree
(1)	(2)	(3)	(4)	(5)	(6)	(7)
0.....	$140	$150	$160	$170	$180	$190
1.....	150	160	170	180	200	220
2.....	160	170	190	200	220	240
3.....	170	180	210	220	240	260
4.....	180	190	230	240	260	280
5.....	190	200	250	260	280	300
6.....	200	220	270	280	300	320
7.....	210	240	280	300	320	340
	Merit Rating[a]					
B[b].....	250	280	320	350	370	400
A[c].....	270	300	340	380	400	450

[a] These represent suggested and immediately practical amounts. In theory there is no fixed limit for merit rewards. They would be conditioned entirely by the type and value of service rendered.
[b] Not to be attained by more than 20 percent of the group.
[c] Not to be attained by more than 7 percent of the group.

two years of training would be $210 per school month while the maximum for four years of training would be $280. In building the schedule the difference between $140 and $210 in the lower group and $160 and $280 in the upper group is taken as the automatic range which indicates the reward for *average*

group performance. Since this is the reward for *average* performance, superimposed merit schedules can legitimately go beyond these maxima because they represent rewards for special individual service beyond the average. The addition of a merit rating, considered from this aspect, is an economically sound and practical procedure.

Since the norms establishing the relationship between the rewards to labor and to teachers will generally hold true, it is

TABLE VIII. COMPARISON OF THEORETICAL AND ACTUAL SCHEDULE

Years of Service	Two Years of Training Theoretical	Elementary Actual	Four Years of Training Theoretical	High School Actual
(1)	(2)	(3)	(4)	(5)
0	140	140	160	160
1	150	150	170	170
2	160	160	190	190
3	170	170	210	210
4	180	180	230	230
5	190	190	250	250
6	200	200[a]	270	260[a]
7	210	210	280	270
	Merit Rating			
B	250	None	320	280[b]
A	270		340	300[c]

[a] Maximum from 1920-24
[b] Second assistant
[c] First assistant

apparent that such procedure will result in a flexible schedule. Where labor is costly, teachers will receive relatively high money salaries and where labor is cheap, and other economic conditions are relatively in agreement, teachers' salaries will tend to follow the relationships discussed earlier. The real salary, as expressed in terms of purchasing power, will tend to be fairly equal for similar types of service. Differentiation between cities of different size and location can be easily determined. The increased rewards for varied amounts of training can be provided by organizing such service in terms of the basic two- and four-

year scale. A sample schedule, built upon these assumptions, is given in Table VII.

The city for which this hypothetical schedule was constructed now has in operation a position-automatic type adopted in 1920 upon the base of an assumed professional cost of living.[12] No recognition is given for merit except in the high school, and no differentiation is made upon the basis of training, except as indicated by position. The comparison is given in Table VIII. In the case of two years of training, the theoretical and the actual are in agreement. In respect to four years of training the actual is $100 lower than the theoretical.

Summary

1. There is apparently a definite relationship between the wages of labor and salaries of teachers which tends to express the differences in standards of living and type of service. The data used indicate fairly regular differences between different types of training based upon service.

2. The relationships are so marked that it is possible to set up certain hypotheses in respect to a law of teachers' salaries. The use of these hypotheses, applied to an actual situation, shows a close relationship to current modern practice, built upon the base of a professional standard of living. The index was determined which might be used to advantage as a basis upon which to build salary schedules.

3. The use of this index agrees with the generally accepted initial differences in the value of two and four years of training.

4. While this index sets up certain definite limits for *average* performance as the present expression of the social value placed upon teachers' service, it must not be assumed that such relationship is permanently set. As the future service of the teacher grows in definite social value and is recognized by the community, it is probable that the upper limits may be changed, particularly the rewards for special merit.

[12] For more detailed discussion *see Public-School Finance*, by A. B. Moehlman, Chicago, Rand, McNally Company, 1926.

A METHOD OF DETERMINING COMPOSITE EDUCATIONAL SCORES

MARVIN L. DARSIE
University of California, Southern Branch

In conducting an educational survey of a school or school system, one frequently wishes to combine the results of several tests into an educational composite score. Such a score affords the best single index of a child's educational status at a given time. Nevertheless, unless accurately computed, it may give a quite erroneous picture of his actual educational achievement. McCall has suggested what might be called a "foot-rule" method of making such a calculation.[1] In the present paper an attempt will be made to extend this conception by discussing both the principles underlying the computation of such a score and a formula which the writer has found useful.

The most obvious method of arriving at a composite score is of course either to add or average the raw scores obtained by the child in, let us say, tests of reading, arithmetic, language usage, and spelling. Or, each such score may be translated into a subject age, and the mean of the subject ages taken as a composite educational age. Either practice is open to the possibility of serious error. No account is taken of four very important factors, namely, variability or range of scores obtainable in each test, the comparative reliability and validity of the tests, and lastly the relative significance of the subjects as factors in school progress. Unless each raw score is weighted with respect to these elements, no adding or averaging process will give a wholly trustworthy composite score.

A method of equating tests having different ranges or dispersions, first suggested by Woodworth, and widely used by McCall and others, is to reduce the raw scores to standard deviation units. In other words, if each raw score is divided by the standard

[1] McCall, W. A. *How to Measure in Education.* New York, Macmillan Company, 1922. 416 pp.

deviation obtained by giving the test to a representative group of subjects, the resulting ratios can properly be added or averaged to secure a composite score. It is worthy of note that this method appears to weight a test in terms of both reliability and variability. Kelley has shown that the raw standard deviation is a product of the true variability of the trait measured and the reliability of the test used.[2] That is,

$$\text{True S.D.} = \text{Raw S.D.} \sqrt{r_{11}}$$

A complete formula for weighting in terms of variability and reliability would be:

$$\text{Weighted Score} = \frac{\text{Raw Score} \sqrt{r_{11}}}{\text{True S.D.}}$$

This obviously is equivalent to

$$\frac{\text{Raw Score}}{\text{Raw S.D.}}$$

It should be emphasized that standard deviations used in this way must have been secured from comparable groups of subjects. It is not permissible, for example, to use the variability of seventh-grade pupils in one case and that of a whole school in another.

It is unfortunate that no very satisfactory quantitative method of weighting an educational test in terms of its validity is available. If valid criteria of successful achievement in the school subjects were available, the coefficient of correlation between a test in a given subject and its criterion would give the weight needed. Thus Root has suggested the validation of group intelligence tests in terms of their correlation with Stanford Binet mental ages.[3] Similarly Franzen has correlated various intelligence tests against a composite of all of them.[4] This method would be promising if applied to educational tests, but no extended studies affording such data are known to the writer.

---

[2] Kelley, T. L. "The Measurement of Overlapping," *Journal of Educational Psychology*, 10:458-61, November, 1919.

[3] Root, W. T. "Correlations between Binet Tests and Group Tests," *Journal of Educational Psychology*, 13:286-92, May, 1922.

[4] Franzen, Raymond. "Attempts at Test Validation," *Journal of Educational Research*, 6:145-58, September, 1922.

The determination of the comparative educational significance of the several school subjects is also a matter of some difficulty. No wholly satisfactory method of attacking this problem is available. Certain lines of approach are suggestive, however. Thus we may take as our criterion the relative amounts of time devoted to various subjects in representative school systems. If we examine the data presented by Cubberley in the Salt Lake Survey for twelve American cities, we find that approximately 60 percent of the whole school time is devoted to the four representative subjects of reading and literature, arithmetic, language usage, and spelling.[5] Of this amount of time 40 percent is given to reading, 28 percent to arithmetic, 22 percent to language, and 10 percent to spelling.[6] This time distribution is presumably a rather accurate index of the relative pedagogical importance of these subjects.

In a search for further data on this point, the writer asked a group of twenty-one experienced teachers to distribute ten points among these four subjects in such a way that they would be weighted according to their significance as factors in school promotion. The means of the judgments thus secured assigned 4.5 points to reading, 2.9 to arithmetic, 1.7 to language, and 0.9 to spelling.[7]

A third method would involve the determination of regression coefficients for the various subjects as derived through correlation with some reliable and valid criterion of school progress. The writer has calculated such coefficients from the correlation of Stanford Achievement scores with Stanford Binet mental ages, obtaining the following figures; reading .607, arithmetic .231, and spelling .118. While the validity of the Binet test as

[5] Cubberley, E. P. *School Organization and Administration.* Yonkers-on-Hudson, New York, World Book Company, 1916. p. 90.

[6] Figures for Los Angeles are averaged in with the data presented by Cubberley.

[7] A variation of this method was used in weighting the Stanford Achievement Test, and is also suggested by L. M. Crabbs in *Measuring Efficiency in Supervision and Teaching.* New York, Teachers College, Columbia University, 1925. 98 pp. (Teachers College, Columbia University. Contributions to Education, No. 175)

a criterion may well be questioned, it has consistently proved to be a fairly good index of school progress, and the regression coefficients tend to corroborate the weights suggested in the preceding paragraphs.

On the basis of the foregoing findings it is suggested that the relative educational importance of the four subjects may be satisfactorily indicated by the following pedagogical weights: reading 4 points, arithmetic 3 points, language 2 points, spelling 1 point. This weighting should probably be modified for the primary grades, but would be accurate and useful in grades four to eight.

We are now in a position to state a usable formula for weighting a raw score. This formula would read as follows:

$$\text{Weighted Score} = \text{Raw Score} \times \frac{\text{Pedagogical Weight}^a}{\text{Raw S.D.}}$$

In ordinary classroom or school surveys the interquartile or semi-interquartile range could be used in place of the standard deviation without appreciable loss of accuracy. Such weighted subject scores could then be added to secure a trustworthy educational composite score. In case two or more tests of one subject, such as reading, were used, it would be necessary to average the separate weighted scores for this subject before adding into the composite total.

This composite score is of course a pure number, having significance only with reference to other such scores secured from a given group. Composite norm scores may, however, be very readily calculated from the age and grade norms furnished by the publishers of the tests. The procedure would be to apply the weighting formula to each norm score, adding the weighted subject scores thus secured to obtain the age or grade norm composite. When this is done it is a simple matter to transmute a

---

[a] If a weight for validity was available, the formula would read:

$$\text{Weighted Score} = \text{Raw Score} \times \frac{\text{Pedagogical Weight} \times \text{Validity Coefficient}}{\text{Raw S.D.}}$$

pupil's composite score into his educational age if this be desired.[9] The only drawback to this procedure lies in the regrettable absence of standard deviation norms for most of the published tests. In the absence of these figures, the standard deviations of the group studied could be applied to the norm scores with fair accuracy.

It may be felt that this method is too complicated and tedious for actual use by principals and teachers. In reply it is urged that once the proper weights have been determined for given tests, the computation of composite scores and educational ages is exceedingly rapid and mechanical. The writer believes that the increased accuracy of the results secured will compensate abundantly for the slight additional labor.

[9] The previously cited work by McCall gives detailed directions for this calculation.

A STUDY OF PUPIL ERRORS IN CHEMISTRY

J. C. BENNETT
East High School, Cleveland

In the spring of 1925, thirty-three chemistry teachers of twenty-four high schools in fourteen different cities gave their pupils a uniform chemistry test. One thousand four hundred and seventy pupils took the prescribed test which was Powers' General Chemistry Test, Form B.[1] Two of the schools were private and twenty-two were public—academic, commercial, and technical. Chemistry is a fourth-year subject in eleven of these schools or school systems, a third-year subject in five, a third- or fourth-year subject in one, and a second-year subject in one. The test results by schools are shown in Table I. For convenience, each group of pupils responsible to a teacher is called a school. Thus "schools" 1a and 1b were taught by different teachers, although they were in the same organization.

Some points taken in part from Table I and in part from more detailed tabulations follow:

Highest possible score	67
Highest score made by any pupil	65
Lowest score made by any pupil	3
Range of lowest quarter	3 to 23
Range of second quarter	23 to 31.5
Range of third quarter	31.5 to 41
Range of highest quarter	41 to 65
Highest median for any school	49
Lowest median for any school	19
Location of school medians	
In first quarter	3 schools
In second quarter	17 schools
In third quarter	8 schools
In fourth quarter	5 schools

In the case of two of the schools (1a and 14) the *lowest* score was above the median of the entire group (31.5). On the other hand, in the case of no school was the *highest* score below this group median.

[1] Published by the World Book Company, Yonkers-on-Hudson, New York, 1924.

TABLE I. RESULTS BY SCHOOLS

School	Number of Pupils	Scores			Rank of Median	Intelligence Quotients		Classification	Scores by Classified Groups		
		High	Low	Median		High	Low		High	Low	Middle
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1a	38	60	33	44	4	129	80	X-Y-Z	X-60	38	49
									Y-53	34	44
									Z-56	33	40
1b	20	50	27	38	6	118	87	X-Y-Z	X-43	29	39
									Y-45	27	40
									Z-50	34	41
2	12	37	13	22	31	—	—	Mixed			
3a	53	58	5	26	27	—	—	Mixed			
3b	21	40	9	27	24	—	—	Mixed			
3c	53	61	8	37	7.5	—	—	Mixed			
3d	23	53	16	25	28	—	—	Mixed			
3e	31	44	15	30	14.5	—	—	Mixed			
4	19	42	19	27	24	—	—	Mixed			
5	9	40	15	28	20	—	—	Mixed			
6	56	46	4	24	29	—	—	Mixed			
7	87	55	14	33	13	139	83	X-Y-Z	X-55	26	41
									Y-48	19	31
									Z-39	14	28
8	50	*65*[c]	27	44	4	—	—	Mixed			
9	55	53	15	27	24	124	100	Mixed			
10a	71	55	15	36	9	180[a]	74[a]	X-Y-Z	X-55	19	36
									Y-48	15	26
10b	73	60	14	29	17	194[a]	67[a]	X-Y-Z	X-60	31	43
									Y-51	14	38
									Z 36	15	23
10c	51	56	12	27	24	178[a]	93[a]	X-Y-Z	Y-56	12	27
11	117	62	29	44	4	—	—	Mixed			
12	9	56	21	48	2	—	—	Mixed			
13	51	54	22	35	10.5	—	—	Mixed			
14	54	63	*39*	*49*	1	124	78	Mixed			
15	16	42	18	28	20	—	—	Mixed			
16a	20	44	22	37	7.5	—	—	Mixed			
16b	39	55	17	27	24	—	—	Mixed			
17	59	62	*3*	35	10.5	—	—	Mixed			
18a	12	47	16	30	14.5	—	—	Mixed			
18b	30	43	*5*	29	17	124[b]	91[b]	X-Y-Z	Y-43	3	29
18c	100	54	7	23	30	131[b]	70[b]	X-Y-Z	Y-54	7	23
18d	124	45	5	28	20	152[b]	63[b]	X-Y-Z	X-45	24	33
									Y-44	5	28
									Z-24	8	14
19a	30	52	11	*19*	33	—	—	Mixed			
19b	25	46	22	29	17	—	—	Mixed			
19c	26	*36*	10	21	32	—	—	Mixed			
20	36	60	13	34	12	—	—	Mixed			

[a](I. B.) Index of brightness.
[b](P. L. R.) Probable learning rate.
[c]Highest and lowest scores are set in italics.

Table II gives a comparison of the norms calculated from about 2,800 scores in Dr. Powers' study[2] and of the corresponding figures calculated from the 1,470 scores included in the present study. It will be noted that the median score established by the author of the standardized test is 36, while the median score for the present study is 31.5.

Dr. Powers, according to his monograph, concludes "that the task set for high-school students is beyond their accomplishment. Evidence is convincing that students obtain no mastery of a

TABLE II. A COMPARISON BETWEEN DR. POWERS' STUDY AND THE PRESENT STUDY

A Pupil Scoring:	Exceeds Indicated Percent of Pupils	
	Powers	This Study
64	98	99.9
55	90	95
50	83	91
46	75	85
40	59	71
36	50	62
31.5	38	50
26	25	28
17	10	9
10	3	2
8	2	0.7

large amount of the materials of instruction." In view of this statement, what must be our conclusion concerning our own chemistry teaching, when our median is 4.5 points below the established median! These results demand consideration.

In an attempt to locate the difficulties that our pupils encounter, a study was made of some of the pupil errors exhibited on the 1,470 test papers. The answers investigated are limited to fifteen items, in which either the formulas or names of

[2] Powers, S. R. *A Diagnostic Study of the Subject-Matter of High-School Chemistry.* New York, Teachers College, Columbia University, 1924. 84 pp. (Teachers College, Columbia University, Contributions to Education, No. 149)

compounds are required. Answers to such questions are selected, because the factors determining their correctness are few in number, and the errors in the answers may possibly be traced to their source. The fifteen test items considered in this study are taken from Part II of Form B of the Powers Test. The test items together with the chief errors in the answers follow:

1. Write the formula Mg (PO_4), inserting correct subscripts. (The valence of each radical is given.)

For $Mg_3(PO_4)_2$, 34 percent wrote 1 for (PO_4); 27 percent, 1 for Mg; and 26 percent, 2 for Mg.

2. Write the formula Mg Cl, inserting correct subscripts. (The valence of each element is given.)

For $MgCl_2$, 32 percent wrote MgCl.

3. Write the formula Li (PO_4), inserting correct subscripts. (The valence is indicated.)

For $Li_3(PO_4)$, 31 percent wrote Li_3; 26 percent wrote 1 for Li.

4. Write the proper subscripts in the formula Al Br. (The valence is indicated.)

For $AlBr_3$, 25 percent wrote $AlBr_2$; 18 percent, Al_2Br; 16 percent, AlBr; 15 percent, Al_2Br_2; and 14 percent, Al_3Br. Other errors occurred less frequently. Altogether, these pupils found 13 incorrect ways to write the formula for aluminum bromide, though the valences of aluminum and bromine were given in the question.

5. Complete and balance the equation: $Na_2CO_3 + Ca(OH)_2 \longrightarrow$ Thirty-one percent wrote $Na(OH)_2$ for sodium hydroxide; 30 percent wrote $Na_2(OH)_2$ for sodium hydroxide; and 11 percent wrote NaOH instead of 2NaOH.

6. Complete and balance the equation: $Pb(NO_3)_2 + H_2S \longrightarrow$ Eighteen percent wrote HNO_3 instead of $2HNO_3$; 17 percent wrote $H_2(NO_3)_2$ for nitric acid; and 13 percent wrote H_2NO_3 for nitric acid.

14. Write the formula for barium chloride. (Valence not stated.)

For $BaCl_2$, 65 percent wrote BaCl; and 20 percent wrote Br instead of Ba.

15. Write the formula for ammonium sulfate. (Valence not stated.)

For $(NH_4)_2SO_4$, 28 percent wrote NH_4SO_4; 12 percent wrote NH_2SO_4; 8 percent wrote Al instead of NH_4; and 3 percent, Am instead of NH_4.

16. Write the formula for ferric chloride. (Valence not stated.)

For $FeCl_3$, 77 percent wrote $FeCl_2$, and 18 percent wrote FeCl.

17. Write the formula for copper nitrate. (Valence not stated.)

For $Cu(NO_3)_2$, 97 percent wrote $CuNO_3$. Other errors were: CuN, $CuNO_2$, CuN_2, $CuNO_4$, $Cu(NO_4)_2$, and $CuSO_4$.

26. Name $KMnO_4$.

For potassium permanganate, 29 percent wrote potassium manganese; 27 percent, potassium manganate; 21 percent, an oxide; 12 percent, a magnesium compound. A magnate was named by eight pupils, magnetite by three, alum, baking power, and an oxalate, by one each, and pro-, pre-, and per-manganic acid by one each.

27. Name CH_3OH.

For methyl or wood alcohol, 40 percent wrote ethyl or grain alcohol; 8 percent wrote methane or methane alcohol; and 7 percent wrote carbon hydroxide. Chromium hydroxide was named by seventeen pupils; glycerine, by fifteen; ammonium hydroxide, by fourteen; carbonic acid, by ten; chloroform, by six; acetic acid, by five; benzene, by three; acetylene, by three; ether, by three; water gas, by two; formaldehyde, by two; and water glass, carborundum, stearine, iodoform, dextrine, starch, and vinegar, by one pupil each. Only 29 percent of our pupils named this compound correctly.

28. Name $K_2Cr_2O_7$.

For potassium dichromate or potassium bichromate, 71 percent wrote potassium chromate; 7 percent wrote an oxide.

Potassium cryolite was named by fifteen pupils; potassium chromide by thirteen; potassium chromate, by thirteen; potassium cyanide, by five; potassium carbonate, by three; potassium perchromate, by two; potassium oxalate, by two; chromic acid, by two; borax, by two. Other names given were potassium criminate, potassium cromoxitate, potassium cryptomate, potassium dicrobinate, cryptic oxide, cyanamide, potassium crominate, potassium oxidate, potassium oxate, potassium citrate, carborundum, cellulose, and calcium bicarbonate.

29. Name $KClO_3$.

For potassium chlorite, 62 percent named potassium chlorate; 29 percent named potassium chloride.

An oxide was named by fourteen pupils; calcium chloride by three; calcium carbonate, chloroform, and potassium climate, by one each.

36. Write the equation for heating ammonium nitrate.

For $NH_4NO_3 \longrightarrow N_2O + 2H_2O$, 69 percent wrote NH_3 as a product; 9 percent wrote NH_4 as a product.

N as a product was written by thirty-three pupils; NO_2 as a product, by nineteen; NH_3 as a product by eleven; NO as a product by ten; Al instead of NH_4, by eight; CH_4 instead of NH_4, by five, and Am instead of NH_4, by four.

According to the monograph issued by the author of the test, 12.7 percent of the pupils wrote this equation correctly.[3] Only 6.4 percent of our pupils wrote the equation without error. However, in the school making our best record on this item, 38 percent of the pupils wrote the

[3] Powers, *op. cit.*, Table II-0, p. 24.

equation correctly; in the school standing second, 29 percent wrote the equation correctly; and in the third school, 22 percent of the pupils made no error in writing this equation.

In this connection, it is of interest to compare the percents of correct responses to the foregoing questions, according to Dr.

TABLE III. A COMPARISON OF PERCENTS OF CORRECT RESPONSES ON CERTAIN QUESTIONS

No.	Question	Powers		This Study		Difference
		Percent	Rank	Percent	Rank	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Formulas:					
1	$Mg_3(PO_4)_2$	87.4	1	70.0	2	+17.4
3	$Li_3(PO_4)$	83.3	2	79.1	1	+ 4.2
	Equations:					
5	$Na_2CO_3 + Ca(OH)_2$	82.1	3	76.4	4	+ 5.7
6	$Pb(NO_3)_2 + H_2S$	70.1	4	77.4	2	− 7.3
	Formulas:					
14	$BaCl_2$	62.2	5	69.2	5	− 7.0
15	$(NH_4)_2SO_4$	59.6	6	44.3	9	+15.3
16	$FeCl_3$	58.6	7	58.2	6	+ 0.4
17	$Cu(NO_3)_2$	49.7	8	57.1	7	− 7.4
	Names:					
26	Potassium permanganate	30.7	9	49.7	8	−19.0
27	Methyl alcohol	28.6	10	29.1	10	− 0.5
28	Potassium dichromate	22.5	11	22.5	12	0.0
29	Potassium chlorite	22.0	12	28.3	11	− 6.3
	Equation:					
36	NH_4NO_3	12.7	13	6.4	13	+ 6.3

Powers' study and according to ours. This is given in Table III. The questions *1* and *3* of Table III, in which formulas are called for, the valences being given, are easiest for both groups of pupils, though our pupils score lower by 17.4 percent and 4.2 percent, respectively. The understanding of valence in our group, if not in both groups, leaves much to be desired. The pupils' inability to write a formula without knowing the valence of the elements involved is indicated to some extent in items *14, 15, 16,*

and *17*, on the easiest of which our pupils stand considerably lower than on those formulas for which valences are given. On questions *1, 3, 14, 15, 16,* and *17* which are pure formula writing, our group is inferior to the Powers' group except on items *14* and *17*.

In an attempt to determine the more specific source of some of the errors in formula writing, the upper 28 percent of the pupils' test papers, with scores ranging from 65 to 50, were examined, comparing on each paper the pupil's responses to ques-

TABLE IV

No.	Formulas	Percent Written Correctly by	
		1,470 pupils	Upper 401
(1)	(2)	(3)	(4)
14	$BaCl_2$	69.2	88.6
15	$(NH_4)_2SO_4$	44.3	75.6
17	$Cu(NO_3)_2$	57.1	74.6

tions on formulas involving the same radicals. For example, on each paper, formulas involving the symbol Ba occur three times; the ammonium radical is used twice in different formulas by each pupil; the nitrate radical occurs six times on each paper; and the sulfate radical, three times.

The pupils with scores above 50 number 401. Inspection of these 401 papers shows that only 4 pupils of the 68 who make errors in the valence of the ammonium radical (occurring twice on each paper) make the same error in valence both times, evidently thinking that the valence of that radical is 2. In other words, in this high group of 401 pupils, only 6 percent of those who make errors in the two formulas involving the ammonium radical, do so consistently, while 94 percent are not consistent in the use of the valence of the ammonium radical, representing it sometimes with valence 1, and sometimes with valence 2, or 3. Forty-six pupils in the group write wrong formulas for one

of the three barium compounds on each paper. In none of these cases are the wrongly written formulas consistent, so far as the valence of barium is concerned. Even among the best students in chemistry, the valences of the radicals named in the foregoing are apparently fixed none too firmly in mind. How much these 401 pupils excel the whole group in writing some formulas is shown in Table IV. In connection with questions 5 and 6 requiring equations in the answers, the difference in the formulas for nitric acid written as a product in each case, shows that to some of our pupils the law of definite composition has little or no meaning.

TABLE V. THE DISTRIBUTION OF SCORES IN SCHOOLS OF HIGHEST AND LOWEST RANK

School	Rank	Percent of Pupils Obtaining Indicated Scores							Number of Pupils
		0–9	10–19	20–29	30–39	40–49	50–59	60–67	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
14	1	.....	.....	.....	7.	46.	39.	7.	54
8	4	.....	.....	6.	18.	40.	26.	10.	50
13	4	.....	.....	9.	27.	38.	24.	3.	117
1a	4	.....	.....	.....	21.	45.	32.	3.	38
18c	30	2.	27.	46.	22.	2.	1.	.....	100
2	31	.....	33.	42.	25.	.....	.....	.....	12
19c	32	.....	38.	38.	23.	.....	.....	.....	26
19a	33	.....	53.	27.	13.	3.	3.	.....	30

The ability to write chemical names of certain compounds, the formulas being given, as shown in Table III is noticeably less than the ability to write certain formulas, the chemical names being given. According to our textbooks, we should be teaching these formulas and chemical names with less failure than we are now doing.

Table V shows the distribution of scores in four schools of highest and four of lowest rank. The distribution for the school that ranked second is omitted because it includes only 9 cases. Examination of the figures in Table V shows that for schools ranking first in the group, the peak of the scores comes between

40 and 49, while for the schools ranking last, the peak comes between 20 and 29.

As to the few answers investigated in this study, one is perhaps justified in drawing the following inferences:

1. In formula writing, pupils do not remember accurately the valences of the ordinary simple and compound radicals; they have not become habituated in the processes involved in formula writing; and they have failed, it seems, to learn a simple and rapid check on the correctness of a formula. We as teachers, overwhelmed by the avalanche of subject-matter which a chemistry student is expected to master, have failed to impress the principles involved and to give the drill which might remedy the difficulty in formula writing. If formula writing is essential in the year's work in chemistry, we must *teach* formula writing and be satisfied with nothing less than achievement of that skill. We cannot half teach it without wasting almost *all* the time put into it.

2. From the two cases of equation writing investigated in this study, it seems reasonable to conclude that good instruction and drill in formula writing will go far to help the pupil in writing equations. Furthermore, we have not yet sufficiently appreciated the advantages to be gained by using word equations to introduce formula equations.

3. Concerning a question which requires a chemical name, the formula being given, one's attention is attracted to the data on the answers to No. 27, the name of CH_3OH, because of the wide range covered by the answers. In that long list, sixteen incorrect names for an organic compound are written. Organic chemistry, as now taught, is not functioning so well as it should. Organic chemistry figures in our daily lives to an extent which probably warrants its logical and systematic introduction into the chemistry course. When we teach it as a properly organized unit, we may hope without undue optimism, that our pupils will no longer confuse wood alcohol with glycerine, acetylene, starch, or vinegar.

PUBLIC-SCHOOL MUSIC

Report of an Experiment in Organizing a Course of Music Study

Osbourne McConathy
Formerly Director of the Department of Public-School and Community Music, Northwestern University

The Department of Public-School and Community Music of the Northwestern University School of Music was desirous of working toward the realization of an ideal plan whereby the results of school-music instruction might be manifested more fully in the average American community. Accordingly, an experimental arrangement was made in 1917 between the University and the public schools of District 75 in Evanston, Illinois, by which the Department of Public-School and Community Music undertook the direction of music instruction in the schools. Heartiest support was given the experiment by the three school superintendents in office from 1917 to 1926. Dr. Ernest A. Smith compiled a comprehensive report of the educational progress in the schools during his five years as superintendent, which was published in June, 1925, by the Evanston School Board. The writer was asked to prepare the portion of the report which dealt with the Music Department and to describe the effectiveness of the music course in actual classroom practice. This article gives the music report, slightly modified to omit irrelevant local references and to admit of explanatory matter and the author's conclusions upon the experimental course.

The expression of a democratic ideal in music education, that served as the basis upon which was built the program for the annual meeting of the Music Supervisors' National Conference at St. Louis in 1919, is the principle which has guided the Music Department in the organization of its work. This doctrine stated, is: "Every child should be educated in music, at public expense, according to his natural capacities, and his music should function in the life of the community." To carry out

this statement a program of study was evolved which embodied the following considerations:

I. A child-study plan by which the natural talents and interests of each child might be determined.
II. Differentiated courses which met the needs of individual children.
III. Departmental organization which in all respects was primarily responsible to the school authorities.
IV. A system of checks, tests, and measurements by which the degree of success of the plan was estimated.
V. Relations with community life which involved organized measures, such as festivals and plays.

I. Child-Study Plan

The plans for child study in connection with the outlined music program included systematic observation of the pupils, a second-grade survey, a fifth-grade survey, and examinations for expressions of musical interests and preferences and for assignments to special music subjects.

1. Systematic observation of the pupils.—Systematic observation is begun in the first grade where pupils are classified upon the basis of their singing ability, as judged by the grade teacher and music supervisor. The children are seated in groups according to this classification, and differentiated instruction is given each group.

2. Second-grade survey.—Singing ability, rhythmic sense, general intelligence, and musical influences at home serve as the basis for the second-grade survey. The first is determined by the music supervisor, the second by the physical-training instructor, the third is a combination of the rating by the grade teacher and scores from intelligence tests, and the fourth by a questionnaire sent to the parents.

The questionnaire attempts to ascertain inherited musical tendencies, environment, natural musical interest and ability, and home musical training. Such questions as the following are asked: Have any of the parents, aunts, uncles, or other relatives shown special musical ability? Is your child surrounded

by musical influences in the home through access to musical instruments or instruction? Has he given evidences of interest in music through his attitude toward musical performances or attempts to sing and perform upon available musical instruments? Has he had any special music instruction and, if so, how much and with what results? The cooperation of Evanston parents was unexpectedly cordial and showed marked interest in their children's music education. The replies to the questionnaire over an eight-year period were grouped as follows: intelligently and carefully answered, 60 percent; less complete but adequate, 20 percent; unintelligent or careless, many of which, however, offered some help to the investigator, 15 percent.

Second-grade children are grouped in five classes in accordance with an evaluation of the four just-mentioned considerations. The 10 percent most musical children are called "A;" the next 20 percent, "B;" the 40 percent average, "C;" the 20 percent less musical, "D;" and the 10 percent least musical, "E."

3. Fifth-grade survey.—The fifth-grade survey[1] is based upon the Seashore measurements of musical talent which are sensory tests of pitch, time, intensity, consonance, and memory; and upon laboratory tests of muscular control, such as rapidity, precision and dexterity of movement, auditory, visual and tactile nerve reactions, free and controlled rhythmic sense, visual memory, and the elements which determine the possibilities of superiority in singing — voice control, singing key and intervals, and tone quality. The results of the Seashore tests determine the pupils who are chosen for the laboratory experiments. The best 30 percent of the children were brought to the laboratory of the School of Education at Northwestern University.

4. Examinations for expressions of musical interests and preferences and assignments to special music subjects. — There

[1] In making this survey the Music Department has had most effective assistance from the School of Education, Northwestern University and Director Elmer E. Jones is largely responsible for the organization and conduct of the entire plan. Advanced students in the course of Education and Tests and Measurements have aided by giving tests and evaluating their results.

are natural inclinations and predilections toward certain forms of musical expression, which, if discovered at the right time, will, we believe, count strongly in finding the right musical studies to be assigned to each individual child. This belief is strengthened by a large number of instances where happy results have followed the assignments of pupils to the study of particular instruments. In one instance the parents were loath to permit a daughter to study piano because three older children had signally failed. Three months after her assignment to piano, however, this child had progressed in her lessons beyond her older sister who had received private instruction for three years. In another case, a son and his parents were most unhappy because the boy's musical interests could not be satisfied due to his inability to sing or play well. Examination revealed weakness in pitch but strength in time, and an unusual discrepancy between the right and left hands. He was assigned to baritone horn, playing bass parts, and soon he was a happy member of the school band. This assignment met his condition as to pitch, time, consonance, motor ability, and the like.

When, upon the basis of the surveys discussed above, or through other channels, a child is considered for assignment to special music work, another type of examination is given, namely, a study of the various physical factors involved in performing on different musical instruments. This includes consideration of such items as the length and flexibility of the fingers, facial formation, teeth, tongue, lips, palate, and lung expansion. This further examination determines with reasonable accuracy the probable success of a child upon a particular musical instrument. The old-fashioned trial-and-error methods are almost entirely eliminated, and we believe that the examinations are reasonably successful in fitting the children to their respective individual talents or interests. The large number of successful assignments to the various departments of music study and the few cases of changes and failures seem to justify our faith in the success of the child-study plan.

According to this plan, the children of our upper grades are classified into three groups: those who attend music-appreciation classes only; those who attend the music-appreciation classes and the singing classes; and those who are given instrumental instruction in addition to the music appreciation and singing.

II. Differentiated Courses

1. Singing classes.—The singing lesson is, in our opinion, the foundation upon which all successful public-school music teaching must be built. Appreciation and instrumental courses, both in content and method, are closely correlated with the singing lesson. Through the singing classes every child is brought into contact with music, his interest in music and love for it are aroused, and his first steps in the enjoyment and understanding of music are taken. The singing class is, primarily, the place where the child may be made conscious of music as a beautiful means for self-expression. Music, while it must be first of all a joy, should be useful, and its usefulness is limited unless a certain degree of power in the subject is developed. Our children are expected to become familiar with a large amount of beautiful and expressive music, and they are led to realize that this is not possible unless a certain fluency in music reading is acquired. Within six weeks, the Evanston children memorized, in 1925, the chorus parts of the opera *Martha* and performed the work with only two rehearsals outside regular music periods.

2. Music appreciation.—The work in music appreciation is carried on according to the plan of listening to selected phonograph records, attending music performances given in the schools for the children, participating in the music festival, and competing in the music memory contest.

A large number of phonograph records of musical selections adapted to the different ages of children are purchased for use in the schools. The policy in Evanston has been to increase gradually our record libraries until a list of material suited to the various purposes of this instruction has been acquired. Material is included for rhythmic activity, such as folk dancing,

dramatization of music, and the rhythmic orchestra, in the primary grades. The list also includes material for all types of correlations with other subjects, such as history, literature, geography, and nature study. Among the records are selections which have to do with the music memory contests and with the study of music form, biographies of composers, and music history, as correlated with the singing lessons.

The Evanston Music Study Club, a group of professional and semi-professional women musicians who are interested in the education of the children, has volunteered its services, and regular recitals of appropriate selections are given for the pupils. This relationship of our school music with that of the city's musical women does much to give the children a better appreciation of what music means in life. The high-school orchestra and the instrumental teachers also assist in bringing to the schools a broader conception of music, and at various times students of the Northwestern University School of Music are called upon to contribute of their talents for the musical development of the school children. An important feature of this educational plan, in addition to the entertainments for the children, is the programs of vocal and instrumental music—individual and ensemble—which are systematically organized by the pupils for the pleasure of their schoolmates. These music performances give the children opportunities to hear music performed on the various instruments, thereby enabling them to develop tastes and preferences which greatly aid us in assigning individual children to particular fields of music study.

The children of our upper grades participate annually during the last week of May in the North Shore Music Festival. The seating accommodations at the gymnasium allow for only twelve hundred children—formerly fifteen hundred before the organ was installed—and with the growth of our school population it is necessary each year to leave out an increasing percent of the children of grades VI, VII, and VIII. As many children as possible are used in the festival in order that they may have this unusual opportunity for musical enjoyment and cultivation.

The older children who are not able to participate because of the inadequate seating accommodations are admitted to the final full orchestral rehearsal. Many varied types of music, from song literature through the various types of cantatas, are given by the children at this annual concert. Even grand opera with a costumed cast acting the parts is occasionally included. *Hansel and Gretel* was presented in 1924, and in 1925 *Martha*, with casts of eminent grand opera stars. The festival is an invaluable opportunity for awakening a consciousness of music as a fine thing in life, and, without doubt, the impressions which the children receive will last throughout their lives. All pupils in the singing classes have the privilege of learning the festival music, for the separation of those who are not to participate from those who are chosen to take part is done only at the latest possible date.

Annual music memory contests have been held in the schools during the past several years. The children entered in this contest spend several weeks listening to certain selected compositions and learning facts about the pieces of music and their composers. To determine the winner the children are given, at the end of several weeks' study, an examination in which brief themes and bars from the selections are played and the contestants required to record the title of the composition, its source, and the name and nationality of the composer. A great deal of musical interest is aroused through the contest in which the children have an opportunity to exercise their instinct for rivalry while becoming intimately acquainted with a large number of standard musical works.

3. Instrumental instruction.—Instrumental instruction in the public schools is given in the departments of piano, violin, wood wind (flute and clarinet), brass (cornet and trombone), and drums.

Piano instruction has been offered in the Evanston schools since 1918 and a thoroughly organized course, based upon the idea of teaching piano in graded classes closely correlated with the pedagogy of the singing lesson, has been developed to a

point where pupils thoroughly cover as much ground as they do in an equal amount of time under private instruction. A number of public recitals which create considerable interest among the parents and friends of the children in the piano classes are given during the school year. Many letters are received from, and interviews held with, parents who express their approval of our course which makes the assigned work so interesting as to eliminate the old-time policing of the children's daily practice. One hundred and seventy children of Evanston's District 75 took piano instruction during the spring of 1925 as did also thirty children in the Boltwood School, an intermediate school of seventh and eighth grades.

Band and orchestra instruction has been conducted for six years and in 1924-25 one hundred and fifteen children of the district received regular instruction with the result that bands and orchestras were organized. One hundred and eighty-six Boltwood children were also receiving this instruction. An orchestra in every school building and several bands, developed by combining children from several buildings, is the goal in this department. Group instruction is given in this ensemble work and every effort is expended to correlate this study, in material and method, with the class-singing instruction.

The eight years of experimentation with the described plan of music instruction points to two conclusions, first, that music can best serve its educational and social purposes by recognizing and providing for individual musical differences in children, and, second, that in the usual school system it is entirely practicable to put such a program into effect.

III. Departmental Organization

All the work in the various departments of music in District 75 is conducted with direct responsibility to the School Board. This plan is different from that of many other localities where conservatory and private teachers are permitted to conduct their work in the public schools and to charge the children for the services given. By this plan of organization all music

instruction is placed upon the same basis of educational work as the other school subjects. All music teachers are paid by salary and direct correlation with the other school activities is the result. The attitude of children and parents toward music is made a much saner and finer one through this procedure and music is regarded as a social force rather than as merely an individual cultural accomplishment. The benefits which a widespread cultivation of music brings to a community are best realized through this organization.

IV. System of Checks, Tests, and Measurements

Little has been done to measure in a scientific way the musical accomplishments of children who have gone through Evanston's public-school music course. They are examined and graded regularly in their music work and reports sent home as is done in the other school subjects. The first attempt, however, to give a systematic survey of the accomplishments of the pupils was not made until 1925 when the Kwalwasser tests were used. The full report of results of this test are not yet available, the tests having been sent to Mr. Kwalwasser at the University of Iowa for complete evaluation. The general statement which has been received from Mr. Kwalwasser indicates, however, that our children have done well in their music work as compared with the children of other cities throughout the country. The actual technical accomplishment, however, is considered of secondary importance to the raising of the social and cultural standards by our music work.

A year ago, as a senior thesis, one of the students in the Music School of Northwestern University made a study of the high-school children who had been given the Seashore tests in grade v. This study demonstrates very definitely that there is a positive correlation between the findings of our fifth-grade survey and the subsequent musical development of the child.

V. Relations with Community Life

From the beginning of my connection with the public-school music work in Evanston the object has been to make our school music studies function in the home and community. Earlier in this report various means have been discussed whereby our school-music studies have been made to function successfully in the home and community. Of the devices suggested and tried out the music festivals are, perhaps, the most effective for linking up the school work with the community. The music memory contests, our mothers' meetings, and Parent-Teacher Associations do, of course, contribute in large measure to the success of the community singing, and our instrumental classes from which grow the bands and orchestras, carry the taste for good music into any number of home groups throughout the city, and thereby provide a means for family activity of a fine nature. One other important link between the school and home, a connection whose helpful influence cannot be exaggerated, is the introduction into the homes of music material learned in the schools. The nature of the song material studied in our music course is a matter of supreme importance, for this material should form a part of the child's conscious and subconscious joy in music. There is every reason to believe that such is the case in Evanston because our school children are unquestionably taking their music with them into their homes, their churches, and their social activities, and thereby enriching the home and community life.

THE EFFECT OF REQUIRED THEMES ON LEARNING

OSCAR A. ULLRICH
Southern University, Georgetown, Texas

College instructors commonly assign themes, at stated times, as a partial fulfillment of the requirements for various courses. These themes may be intended to develop technique and style in writing, as in the case of courses in English; to force original thinking; or to compel study and accuracy in work, as well as to secure information from parallel reading and other sources. The precise method of handling such themes varies with each instructor as well as with the nature of the subject-matter treated. No attempt will be made here to describe the various methods in common use, but the particular method employed in this experiment will be described later.

The problem with which this study is primarily concerned is: To what extent does the preparation of themes in such a content course as education or sociology aid the student in the acquisition of information?[1]

METHOD OF PROCEDURE

Every theme, in a sense, may be regarded as a problem. In fact much of the theme work required in this study consisted of problems, for the information necessary was obtained from parallel reading and from such other sources as the students found available. For purposes of this investigation the sophomore course in Child Psychology Applied to Education was used—a thirty-six-hour course, meeting three hours each week on alternate days for a term of three months. In 1924-25, this course was repeated each term throughout the year. For the fall term four sections were organized as follows: Sections I and III met at eight o'clock and ten o'clock, respectively, on Mondays, Wednesdays, and Fridays; and Sections II and IV met at eight o'clock and ten o'clock, respectively, on Tuesdays,

[1] Acknowledgment is hereby made to Doctors A. Caswell Ellis, C. T. Gray, Helen Lois Koch, and Miss Rietta Simmons, of the University of Texas, for their cooperation and valuable suggestions.

Thursdays, and Saturdays. Sections I and IV were taught by Instructor A and Sections II and III, by Instructor B.

Instructor A required a weekly theme from each student in Section I, while no papers of any kind were required from the students in Section IV. In other respects the two sections were handled in essentially the same manner. In other words, the same method of instruction, with the exception of the theme requirement in Section I, the same subject-matter, the same number and type of hour tests were used in the two sections. The subject-matter given and the references assigned were kept as uniform as possible by means of a detailed syllabus or outline. The method of instruction used for both sections was a combination of lectures, assigned readings, questions and answers, and class discussions. The combination was varied to suit the topics under consideration, the materials available for use, and the interests of the students.

The written work required of the students of Section I was graded, corrected, and returned to the students. On the day the papers were returned, the instructor discussed the errors that seemed most common. Each student was directed to read carefully the comments and corrections made on his paper, although no check of this was made. The same amount of time consumed by Section I in the discussion of the papers was devoted in Section IV to a discussion of the same topics on which the students of Section I had written papers.

Instructor B followed the same method of procedure, requiring the weekly papers of the students of Section III, which met at ten o'clock, but not of Section II, which met at eight o'clock. Each pair of sections under a given instructor had the same number of days of instruction. The average number of absences per section was about 1.4, with a standard deviation of about 1.0 and was distributed about equally among the students within the various sections.

In order to neutralize the difference between the psychological level of the paper group and the no-paper group, taught by

the same instructor, a psychological test[2] was given to each section at a regular class hour. And for purposes of comparison only those students were selected in the one group whose psychological scores could be paired within a range of two points with the psychological scores of the students in the other group. This method of pairing students was used in each repetition of the experiment. In Table IV, however, in which the results of the experiments for the several terms are combined, the records of all students are used.

The means used for measuring the effect of the preparation of weekly papers on learning were the final examinations. The results of the hour tests given during the term were not used because the tests were somewhat different for each section taught by the same instructor. The final examinations were given to all four sections at the same time. Each instructor prepared the final examination for her two sections independently of the other. Although the questions were not the same for the two pairs of sections, this fact should not affect the validity of the experiment because the comparisons in each case were made between the two sections taught by the same instructor.

Certain checks were applied to eliminate, if possible, the disturbing factors that entered into the experiment. At the end of the term, Section IV was larger than Section I by nine students because of transfers and withdrawals. As for Sections II and III, the difference in enrollment at the end of the term was only three—a difference which would seem to have little influence on the results. The possible effect on learning of a difference as large as that found between Sections I and IV can be neutralized by repeating the experiment a number of times and by reversing the conditions. Both of these controls were used in the subsequent terms.

It may also be possible that the eight-nine o'clock hour is more conducive to good work than is the ten-eleven o'clock hour.

[2] The University of Texas Freshman Psychological Examination (1924 Edition) was used. The test was designed to predict success in college work. It has a product-moment correlation of 0.447 ± 0.019 with the average of the college marks for the fall term 1924 for the University at large and of 0.497 ± 0.012 for only those students who pursued five full courses.

Laird's "A Study of the Influence of Sectioning Students upon Their Achievement"[3] seems to indicate that the nine-ten o'clock hour is better than the eleven-twelve o'clock hour. He found that classes meeting at eleven o'clock tend toward "averageness" while classes meeting at nine o'clock contain students who make both better and poorer grades than do those who are in eleven o'clock classes. It is possible that a similar difference exists between the eight-nine and the ten-eleven hours. In this experiment the effect of the time of the day on learning was partially controlled by requiring themes of the ten o'clock class in the winter term and none of the eight o'clock class taught by Instructor A, while in the fall term themes were required of the eight o'clock class. In the sections taught by Instructor B, papers were required of the class which met at eight o'clock in the winter term but not of the class meeting at ten o'clock, whereas in the fall term papers were required of the class at ten o'clock but not of the eight o'clock class.

The criticism may be made that the instructor's variation in method of teaching from day to day was neither eliminated nor measured, and that the questions asked by the students in the two sections in question were not the same. This point is granted. It does not seem possible at the present time to standardize the method of instruction, the materials presented, and the free interplay between the minds of the students and the mind of the instructor without destroying the natural teaching situation. Since the personality of the instructor and the responsiveness of the class may be regarded as two of the most important factors in the teaching situation, it was thought best not to standardize further the methods of instruction and the materials presented.

Results

The results of the work of the fall term are shown in Table I by a comparison of the results of the groups which had a weekly

[3] Laird, Donald A. *Journal of Educational Psychology*, 14: 143-53, March, 1923.

paper and the groups which had no paper. Complete records of thirty students taught by Instructor A were obtained for each group by the process of pairing, namely, thirty students out of a total enrollment of thirty-four for the paper group and thirty out of the total enrollment of forty-six for the no-paper group. The records of nineteen cases taught by Instructor B were selected for each group out of thirty-one for the paper and thirty-four for the no-paper group.

TABLE I. COMPARISON OF THE RESULTS OF THE WEEKLY-PAPER GROUPS AND NO-PAPER GROUPS TAUGHT BY INSTRUCTOR A AND INSTRUCTOR B—FALL TERM

	Number of Cases	Educational Scores			Psychological Scores		
		Mean	S. D.	P. E.	Mean	S. D.	P. E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Groups taught by Instructor A						
Paper groups	30	156.13	29.40	19.83	66.90	11.94	8.05
No-paper groups	30	152.33	33.54	22.62	66.83	12.83	8.51
Difference	.....	3.80	.....	.....	.07	.....	.....
	Groups taught by Instructor B						
Paper groups	19	76.79	7.20	4.85	62.70	11.29	7.62
No-paper groups	19	75.31	8.42	5.68	62.68	11.74	7.92
Difference	.....	1.48	.....	.....	.02	.....	.....

The difference between the means of the educational scores, as shown in Table I, indicates that the weekly-paper group did slightly better than the no-paper group. The difference is, however, relatively small, being only 3.8 with a probable error of 2.13. The chances of a reversal are about one in ten. The data for Sections II and III taught by Instructor B were treated in the same manner as for Sections I and IV taught by Instructor A. The advantage is in this case also in favor of the weekly-paper group to the extent of 1.48 points. But, since the probable error of the difference is as high as 1.71, this differ-

ence is not significant. The chances of a reversal are about one in four.

The experiment conducted during the fall term was repeated during the winter term with four other groups of students taking the same course. The same experimental conditions were observed except that the requirement of themes for the paired sections was reversed. The same instructors taught the classes and the same methods of instruction were used.

TABLE II. COMPARISON OF THE RESULTS OF THE WEEKLY-PAPER GROUPS AND NO-PAPER GROUPS TAUGHT BY INSTRUCTOR A AND INSTRUCTOR B—WINTER TERM

	Number of Cases	Educational Scores			Psychological Scores		
		Mean	S. D.	P. E.	Mean	S. D.	P. E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Groups taught by Instructor A						
Paper groups	11	186.18	28.02	18.90	68.09	15.45	10.42
No-paper groups	11	169.27	34.87	23.52	68.00	15.39	10.25
Difference	.....	16.91	.....	.....	0.09	.....	.....
	Groups taught by Instructor B						
Paper groups	10	76.8	11.80	7.96	67.5	13.80	9.31
No-paper groups	10	70.4	10.67	7.20	67.4	13.69	9.23
Difference	.....	6.4	.....	.....	0.1	.....	.....

The classes were smaller in the winter term than they were in the fall term. Furthermore, the winter term had only thirty-one class hours, exclusive of holidays, as compared with thirty-four in the fall term. These differences in the conditions between the fall and winter terms should not invalidate the results, because the comparisons are made between the groups reciting during the same term. One exception to this practice was made. After the series of experiments was completed, the results of the weekly-paper and the no-paper groups for the various terms were combined in a manner that is described later.

The results for the winter term are given in Table II. After pairing the students taught by Instructor A, using their psychological-test scores, eleven cases were obtained from each group. According to Table II the difference between the mean scores of the groups taught by Instructor A was 16.91 points in favor of the weekly-paper group with the probable error of the difference as 9.09, but it will have little statistical significance, since the chances of a reversal are less than one in ten. The difference between the groups taught by Instructor B favors the paper group by 6.4 points, but, since the probable error of the difference is 3.39, the difference is not statistically significant. The chances of a reversal are about one in ten.

TABLE III. COMPARISON OF THE RESULTS OF THE WEEKLY-PAPER GROUPS AND NO-PAPER GROUPS TAUGHT BY INSTRUCTOR A AND INSTRUCTOR B—SPRING TERM

	Number of Cases	Educational Scores			Psychological Scores		
		Mean	S. D.	P. E.	Mean	S. D.	P. E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Paper groups	25	66.52	6.29	4.24	65.72	12.80	8.63
No-paper groups	25	61.76	7.61	5.13	65.76	12.32	8.31
Difference	.....	4.76	.....	.....	0.04	.....	.....

In the spring term of 1925, our experiment was repeated once more in the same course, but with two sections only. Both of these sections were taught by Instructor B. The results obtained from these sections are given in Table III. In this case twenty-five records were obtained for each section. The difference in the scores between the weekly-paper group and the no-paper group is 4.76 points with a probable error of 1.33, indicating in this instance that the chances of a reversal are about one in one hundred and fifty.

In order to eliminate the possible differences between the weekly-paper groups and the no-paper groups due to such variables as the size of the classes, the time of the day, and the day

of the week when the classes met, the results of the paper groups and the no-paper groups for the various terms were combined. The results, as combined, are given in Table IV for the sections taught by Instructor A and by Instructor B. The raw scores only were used for these comparisons. The results combined for the various terms are consistent with the results shown for each of the terms separately. The difference between the means of the educational scores of the groups taught by Instructor A is

TABLE IV. COMPARISON OF THE COMBINED RAW SCORES OF WEEKLY-PAPER AND NO-PAPER GROUPS FOR FALL, WINTER, AND SPRING TERMS AS TAUGHT BY INSTRUCTOR A AND BY INSTRUCTOR B

	Number of Cases	Educational Scores			Psychological Scores		
		Mean	S. D.	P. E.	Mean	S. D.	P. E.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Groups taught by Instructor A						
Paper groups	51	162.94	30.71	20.71	66.29	12.48	8.41
No-paper groups	61	154.64	38.59	26.03	66.19	14.65	9.88
Difference	.....	8.30	.....	.....	0.10	.....	.....
	Groups taught by Instructor B						
Paper groups	74	71.73	10.21	6.89	65.32	12.27	8.28
No-paper groups	103	70.59	12.88	8.69	64.77	12.82	8.65
Difference	.....	1.14	.....	.....	0.55	.....	.....

8.30 points with a probable error of the difference of 4.41, which indicates that the chances of a reversal are about one in ten. For the groups taught by Instructor B the difference between the means of the educational scores is 1.14 points with a probable error of 1.17, or about one chance of a reversal in four.

The combining of the data for the various terms is subject to three criticisms. First, the number of days on which the classes met was not the same for the three terms. In the winter term, there were 31 class hours, exclusive of holidays; and in

the spring term, 33, as against 34 for the fall term. Second, Instructor B revised the final examination somewhat for the various terms, while Instructor A used the same final examination for the fall- and winter-term classes. And third, the experience acquired during the fall term either from other courses pursued or from extra-curricula activities may have influenced the results in the winter and spring terms in a way that it did not influence the fall term's results. The results shown in Table IV are in error to the extent in which they have been influenced by the factors mentioned above. They are given for what they are worth.

An examination of Tables I to III shows that in all repetitions of the experiment the differences between the weekly-paper and the no-paper groups are not highly significant statistically, with the possible exception of the results shown in the first half of Table III.

Discussions and Conclusions

It may be argued that since the results are positive and in favor of the weekly-paper groups in all five trials, we have some reason to hold that the requirement of weekly-papers is beneficial to learning of a certain sort, even though the difference is not statistically significant for any one of the experiments, with the possible exception of the difference obtained in the spring term, as shown in Table III. If this point is granted, the question still remains whether the requirement of weekly papers offers sufficient advantage to the paper group over the no-paper group to compensate for the extra amount of work and time that is involved for both the students and the instructors, especially when large classes are concerned.

The fact that the difference between the means of the paper and the no-paper groups in the spring term is fairly significant, seems to need further comment. The chances of a reversal in this case are roughly one in one hundred fifty. The significance of this result is, perhaps, due to the practice effect on the part of the instructor. As a matter of fact, the differences between

the means of the paper and the no-paper groups became progressively more significant from the fall to the spring term. This was true for both instructors, as may be seen from a study of the tables.

A few explanations may be offered for the fact that the paper groups did practically no better than the no-paper groups. First, if weekly papers are required, the students may devote the greater part of their time to the paper work and neglect to a corresponding degree other phases of the work. Second, required themes, which are usually regarded as disagreeable tasks, may not arouse the students' interest sufficiently to cause the information collected to be retained for any appreciable length of time. In short, students may simply find stereotyped solutions to the problems assigned or find the information called for and copy the results in a mechanical fashion. Third, students may work out the solutions to the problems or write themes not with the intention of remembering the subject-matter but rather with the intention of forgetting the content, much as they seem to do when they take final examinations. And finally, it is possible that the type of examination given in this study did not test adequately the effects of theme work on learning. This last point was checked, in a measure, in the groups taught by Instructor A. Instructor A included essay questions, or rather problems, in the final examination. The results of this study point to a question that seems to lie deeper than the one here investigated, that is the question of the motivation of theme work—a problem which seems to demand investigation.

Editorials

THE EXPANDING EDUCATIONAL PROGRAM

This year we celebrate the one hundred fiftieth anniversary of the birth of our Republic. Scarcely more than twice that length of time has elapsed since the first English colony was founded in America. Education of children at public expense was no part of the program of the Virginia settlers; moreover, several of the colonies were by no means committed to the idea when the Republic was born. Since that time, however, we have progressed rapidly. Each state has its state school system and the narrow curriculum of colonial days can hardly be compared with the program of today. Compulsory-attendance laws which are now a part of the code of every state prove that the old theory that education is a privilege which the state offers and which may be accepted or refused at the pleasure of the child or his parents has changed to the theory that it is an obligation which the state cannot afford to permit anyone to avoid. The curriculum of our large cities, and to a certain extent of our smaller places, includes not only a wide range of academic studies, but is supplemented by vocational and industrial subjects quite as extensive. Continuation schools not only provide opportunity for the children who must labor, but in most places are mandatory upon those who are not in a gainful occupation, if they have not obtained a certain specified degree of accomplishment and are still within certain ages.

We can only appreciate the extent to which our educational program has been expanded when we note the many activities that are now included and the fields which were not formerly reached. Institutions for the deaf and blind are no longer con-

sidered asylums but educational institutions. Institutions for delinquents are not penal but educational. Night schools, Americanization classes, visiting teachers, and school nurses are making knowledges and skills and American ideals available to adults as well as children. The old theory that the schools are organized and supported by the state for the benefit of those children who wish to profit thereby has gradually changed to the new theory that the schools are supported by the state in order that every citizen may have an opportunity to profit by an education to the fullest extent of his capabilities, and that such education is so important that no child can be permitted to escape its influence.

This expanded program has developed because of the initiative and foresight of educational leaders and the demand of those outside the schools who are vitally interested in social and civic welfare. With knowledge expanding in every field, with communication and transportation making the remotest parts of the earth neighbors, with civic and social problems ever increasing in complexity, there is no indication that the educational program has expanded to its maximum. We are told that the cost is bankrupting us since the schools are receiving 40, 50, 60, or more percent of the total taxes paid by our people and the constantly increasing tax rate is rapidly approaching, if it has not already reached, the point of confiscation. There are those who declare that we have overexpanded; that the educational program not only cannot continue to expand, but that it must be retrenched. It is easy to show the proportion of total taxes which are expended for education. It is not easy, however, to show that the other functions of government which take our taxes are more important than education or are deserving of a greater proportion of the total than they now receive.

The challenge is both to education and to every other activity of the state. Each department ought to render a full account of its accomplishments for the money received. Such accounting ought to be in terms which can be equated, in order that we may justly arrive at a conclusion concerning the support

which each should receive. The schools should find a way to evaluate their work, not only in terms of achievement in academic subjects, but in terms of growth in those characteristics which make efficient productive citizens. We should somehow find a way to determine whether the value of the money expended for a paved road in a given community is worth more or less than the same amount of money expended on a specific part of the educational program in the same or another given community. We have long decided such questions in terms of politics and sentiment. It is time that educational research set itself seriously to the task of evolving a means by which such questions may be settled on less debatable grounds.

E. J. A.

Reviews and Abstracts

BLACKHURST, J. HERBERT. *Directed Observation and Supervised Teaching.* Boston, Ginn and Company, 1925. 420 pp.

This book is a definite contribution to teacher training through practice and observation. It is clearly organized. Each of its forty-five "lessons" deals with a specific problem. These lessons run all the way from "Seating and Blackboards," "Lesson Types," and "Teaching Pupils to Think" to "Developing Initiative and Responsibility." Four large groupings are presented. Part I deals with the setting in which the educational process is carried on. Part II is a discussion of the process of instruction. Part III concerns the attitude of prospective teachers towards practice teaching. Part IV guides the student through a period of actual instruction.

Samplings of results gleaned from the diaries of participating students are included. These excerpts serve to illuminate the principles set forth in the body of the discussion. The statements are clear and unmistakable, yet the call for independent thinking and initiative is not disregarded. The guidance offered is in the nature of a compass and not mere mechanical charts.

The author of this book accepts current practices and proceeds to suggest fruitful ways of improving these practices. There is much to be said in favor of some such fundamentalist view in the light of reckless experiment even if the old authorities have lost their sanction. The book is a practical and helpful manual in the field of "Directed Observation and Practice Teaching."

University of Wisconsin H. L. MILLER

BRUNER, HERBERT B. *The Junior High School at Work.* New York, Teachers College, Columbia University, 1925. 109 pp. (Teachers College, Columbia University, Contribution to Education, No. 177)

Junior high schools have been defined by many specialists in this field as "broadening, finding, and sorting schools," but little real finding and sorting have been accomplished by these schools during the past decade. However, a real work of educational pioneering has been accomplished at Okmulgee, Oklahoma, under the advice and guidance of Professor T. H. Briggs of Teachers College, Columbia University. In order to find the aptitudes of junior high-school entrants at Okmulgee "broadening and finding courses" have been devised and elaborated in which the pupil is permitted to survey the work that lies ahead in each of several fields, for the purpose of broadening his mental and social horizon and at the same time of uncovering or discovering his aptitudes or interests in some particular field of work. From the purely curricular side these "broadening and finding courses," as they are called,

show the pupil what he will have to study, and what advantages he may hope to secure, if he continues his school work in mathematics, English or Latin. This helps in a wise choice of school electives. From the vocational side the "broadening and finding courses" in electrical work, banking, or business show the pupil what are the requirements for success in these fields. This may help in a more wise choice of future vocation.

A second innovation worked out by Okmulgee is the use of the "class-club period" or "home-room period" or "leisure-time period"—now pretty generally a part of the better junior high-school weekly program—to supplement and to extend the usefulness of the "broadening and finding" courses.

Enough has been said to show that progressive junior high-school superintendents and principals will have to turn their attention to the Okmulgee plan if they wish their own schools to partake of the newest and best things in junior high-school practice. The outline of the plan and its administration is all too briefly told by Dr. Herbert Bruner in "Teachers College, Columbia University, Contributions to Education." The plan itself is worthy of a more detailed and elaborate publication which we hope will follow.

JOSEPH K. VAN DENBURG

Board of Examiners, New York City Schools

PROCTOR, WILLIAM M. *Educational and Vocational Guidance.* Boston, Houghton Mifflin Company, 1925. 352 pp.

Dr. Proctor's book, which is a valuable contribution to guidance literature, brings together in an interesting and comprehensive manner the results of his extensive research. Headings of a few chapters are: "Democracy;" "The Function of Guidance in the Public-School System;" "Relation of Special Interests and Abilities to School and Vocational Success;" "Organization of the Program of Studies for Guidance with Possibilities in Elementary, Junior High, and Senior High Schools;" "Guidance through Provision Made for Individual Differences;" "Guidance in Character-Building Activities;" "Guidance in Making Vocational Choices;" "Guidance and Placement;" "The Organization of Guidance."

At the end of each chapter there is a list of "Questions and Problems" which are full of suggestions to the student and counselor, and an excellent up-to-date bibliography on the subject of the chapter. These lists of readings, when combined, probably give us the best existing bibliography on the subject of guidance.

This book should be at the elbow of every teacher who is interested in studying educational problems, of every teacher who wishes to see the practical use of tests, of every teacher who is thinking of the future of the individual pupil with his interests, capacities, and needs, of every student of the adolescent, and of every school administrator who is planning curricula for "all the children of all the people," and especially for high-school principals and counselors.

EDWARD RYNEARSON

Director Vocational Guidance, Pittsburgh Public Schools

Cox, Philip W. L. *Curriculum Adjustment in the Secondary School.* Philadelphia, J. B. Lippincott Company, 1925. 306 pp.

Curriculum-making or readjustment seems to be the central theme among educational workers at the present time. Dr. Cox's book on *Curriculum Adjustment in the Secondary School* is one more contribution to this field, which, as yet, is not over-crowded by thoroughly helpful material. The author recognizes three basic facts to be reckoned with in inaugurating a program which will properly function in secondary education today. These facts are the changing interests and activities of adolescent boys and girls, the greatly changed and constantly changing social environment, and the contributions of psychology to the fields of learning and teaching.

The book is divided into three parts. In the first, the author presents a picture of the present-day situation; in the second, the scientific basis of the secondary school; and in the third, sixteen principles of curriculum adjustment. The first phase of the subject is treated briefly, the second in a more extensive manner, but the most emphasis is given to these sixteen principles and their application.

The author has drawn profusely from other writers in the secondary field. The illustrations are apt, and the annotated bibliography is exceedingly helpful. To one with creative imagination the book will be found to contain a large amount of stimulating material which can easily be translated into practice. To the unimaginative, the concluding paragraphs under each principle, which purport to tell what can be done by secondary schools, will be largely disappointing, because a detailed panacea is not presented. After his experience with secondary schools Dr. Cox realizes that whatever the principle or the general application which should be made in a particular case, there must be individual adjustment because of existing variations.

E. J. Ashbaugh

Ohio State University

Bopp, Leon. *Principes Generaux de Pedagogie D'Amiel.* Paris, Librairie Felix Alcan, 1925. 133 pp.

This slim volume, consisting of some 30 pages of introduction by M. Bopp and about a hundred pages of Amiel's text, strikes a surprisingly modern note in view of the fact that the *Principes* here published for the first time date back to 1880. The casual reader will find M. Bopp's introduction more illuminating perhaps than the detailed division and subdivision of Amiel's notes, not only because the latter are so detailed but because they exhibit unmistakably the influences of a psychology which is not quite respectable at the present time in this country. Nevertheless, the method followed by Amiel in his "Principles" may well be of considerable interest at this time when American educators are so notoriously averse to anything savoring of "theory."

Amiel in treating the problem of education asks *"tout d'abord quelle est la véritable destination de l'homme, sa vraie fin, celle sur laquelle le pédagogue doit régler sa méthode."* Even those who will not agree with his

answer can hardly deny that the question is more pertinent for having been so seldom faced. The text, after dealing with some of the agencies and difficulties of education suggests the part education may play in the perfection of man. "Perfection" is, of course, a word to be received with scoffing these days, and not without reason. Nevertheless, Amiel's account of the meaning of this goal contains some valuable material, particularly the section on perfection as the realization of one's individuality. M. Bopp does a real service in bringing these notes to the attention of educators, American as well as French.

T. L. SCHOLTZ

Ohio State University

DONOVAN, HERMAN LEE. *A State's Elementary Teacher-Training Problem (Kentucky).* Nashville, Tennessee, George Peabody College for Teachers, 1925. 92 pp. (George Peabody College for Teachers, Contributions to Education. No. 17)

Dr. Donovan has made a careful study of the history of teacher training in Kentucky, the present status of teachers in the state, the need for trained teachers with facilities for preparing them, and the cost of professionally trained elementary teachers to the state of Kentucky. Through the cooperation of the General Education Board, he was able to deal with a large number of data collected under the direction of Dr. Frank P. Bachman. Dr. Donovan has brought together from various sources some highly interesting facts concerning the history of teacher training in Kentucky, and its relation to the struggle for state support.

A few of the facts concerning the present status of elementary teachers in the state show: (1) that Kentucky has a relatively high percent of men teachers in elementary schools; (2) approximately 15 out of 100 of the teachers of the state have adequate training; (3) three-fourths of the teachers secure their licenses by examinations; (4) more than 50 percent of the teachers serve fewer than five years; (5) 42 out of each 100 teachers in Kentucky are teaching for the first time in their present positions; (6) in 86 percent of the rural schools only a seven-month school term is maintained; and (7) the median salary paid Kentucky teachers is much lower than the median salary paid teachers in the United States as a whole. Judged by their intelligence-test scores, many students now in Kentucky normal schools are undesirable candidates for the teaching profession.

After showing the need for trained teachers and facilities for preparing them, Dr. Donovan computed what it would cost the state of Kentucky to maintain an adequately trained elementary teaching staff. In this connection he says:

> It is assumed that if the state should adopt the salary of $1,028 as a median salary it could employ professionally trained teachers . . . . The cost of maintaining elementary schools on the above-named salary would amount to $38.65 per capita for each child in average daily attendance. When this cost is compared with what California and other states are spending for public elementary schools, it is recognized as conservative.

One of the chief problems encountered in this study of school finance was the fact that Kentucky does not have one system of schools but many systems, each operating under different standards.

This study should be of great assistance to the school authorities of Kentucky and should help in determining the reasonable teacher-training program for the future.

P. R. STEVENSON

Ohio State University

JORDAN, A. M. *Children's Interests in Reading.* Chapel Hill, North Carolina, University of North Carolina Press, 1926. 103 pp.

This book is an extension of a previous study, also entitled *Children's Interests in Reading,* belonging to "Teachers College Contributions to Education," but now out of print. This study falls into three parts, a report of books read in children's rooms of libraries, the results of a questionnaire filled out by over thirty-five hundred children in 1917-18, and the results of the same questionnaire filled out by fifteen hundred additional children in 1925. The last is the new section, although the other sections are almost completely re-written and much condensed. Of the three parts, the first is the most interesting, since it best presents the natural likes and dislikes of the children. The other two parts, summarizing preferences expressed in the schoolroom, though as carefully guarded from school influence as possible, are not so satisfying, although quite significant.

The conclusions, especially in the final chapter, "An Attempted Explanation of Children's Interests" suggest a field for further study. The author frankly gives his own interpretation of the facts in terms of situations and of instinctive interest or attention. Whatever the conclusions, it is obvious that we should have more data. Judgments of adults as to what is the predominating appeal of a book, such as "adventure," "home life," etc., are not sufficient.

The facts presented suggest a pertinent question concerning current school practice. If the reading interests of boys and girls are as different as the data seem to show, what about our common custom of providing the same reading matter in the school for both boys and girls? Or if we must provide the same kind, what should that kind be?

E. W. DOLCH

University of Illinois

BUCKINGHAM, B. R. *Supply and Demand in Teacher Training.* Columbus, Ohio, Ohio State University, 1926. 182 pp. (Bureau of Educational Research Monographs, No. 4)

This study of existing conditions was made possible by a subvention from the Commonwealth Fund and is an effort to determine the existing supply of trained teachers in Ohio. The investigation was made with a view of determining the adequacy of the present training facilities and the character of the training of those who yearly constitute the new teachers for the public schools of the state. The data collected covered the year 1923-24, and embraced as complete information as could be obtained regarding the teachers

new to the state. Card data relating to 5,593 new teachers were secured, and the information gathered was estimated to be from 90 to 95 percent complete.

From the study of these data it was conservatively estimated that Ohio needs, under present conditions, approximately sixty-five hundred new teachers each year. With a total teaching force of approximately thirty-six thousand, this represents a turnover of approximately 18.6 percent. The total supply of new teachers for the year 1923-24 was 4,859, or approximately 75 percent of the conservatively estimated needs of the state. If those with but one year of training be omitted as inadequately trained teachers, the supply decreases to but 57 percent of estimated needs.

The investigation was under way for eighteen months, and as one reads through the report it can be easily understood that this amount of time was needed for such a study. The enormous amount of labor which an investigation of this type involves is evident. Of the results obtained and the conclusions drawn from the investigation, we will comment briefly on a few that seem of the most importance.

The report is clearly right in maintaining that the time has come when teacher training ought to be unified and organized upon a broad and comprehensive state plan and placed under state direction and control. The whole problem of teacher training should be studied continuously by some central authority, and the different institutions engaged in the service—public and private—should be guided as to the types of training they can best offer to be of maximum service to the state. An important purpose in all such study and guidance should be the formulation of minimum standards and requirements, the promotion of a reasonable variation and specialization in types of work attempted, and an agreement on regulations that will tend to control supply and demand, rather than rigid state control and the enforcement of a cramping uniformity on all.

The one-year county normal training class, which exists in Ohio as well as in some two score other states, has been at best but a makeshift, and it has no place in the program of a state that can afford something better, as Ohio clearly can. The argument for such classes has been that they supply the rural schools with about the only trained teachers they ever secure. While the study shows this to be true for Ohio, it also shows that but 59 percent of the graduates of these county normal schools go to the rural schools to teach, and that, of approximately fourteen hundred new teachers needed for the one-room rural schools, but 537 came from these county training classes. The utter inadequacy of these schools in library and equipment as well as permanence, also is revealed. The study further shows that the presence of these one-year training classes is clearly leading to lower standards in the state by a gradual replacement of graduates having two or more years of professional training by those with but one year. The conclusion is inevitable that these one-year classes ought to be abolished as early as possible, and a minimum of two years of professional preparation be insisted on.

The discussion of supply and demand, and the desirability of preserving a relation between the two, both as to total supply and different types of sup-

ply, is good. The difficulty lies in carrying out such a proposal, for supply—even the different types of supply—is to a degree an economic question.

On the basis of this important study a state program for teacher training in Ohio can now be laid down, the main elements of which should involve at least the following: (1) the organization of a state division of teacher training within the State Department of Education; (2) the establishment of needed new state teacher-training institutions; (3) the gradual reduction of the accredited list of training institutions, as supply increases, by the raising of standards, and the early elimination of the one-year county normal schools; (4) the requirement, after a fixed date, of a minimum of two years of professional preparation beyond high-school graduation for elementary-school teachers, and four years of added training for high-school teachers, with the enactment of a state minimum-salary law, after the Pennsylvania plan, that will make such training economically possible; and (5) the more complete adoption of the county unit for school administration, probably with a substantial premium on consolidation in the apportionment of funds, with a view to the provision of better supervision and the elimination of most of the one-room schools that today serve as an excuse for the retention of the county normal school.

The study represents an important contribution to our knowledge of existing conditions and needs in one state, and is the type of study that state departments of education and the rising research bureaus of our state teachers' associations could make with advantage for each of our states. It is only through the collection and interpretation of such data that an intelligent program for future development can be formulated.

ELLWOOD P. CUBBERLEY

Stanford University

HANKIN, HANBURY. *Common Sense and Its Cultivation.* New York, E. P. Dutton and Company, 1926. 280 pp.

The purpose of this book is stated as a determination of "How we arrive at sensible decisions without having the least conscious knowledge of how we do so." Common sense is attributed to the subconscious mind, which supposedly has greater powers of recognition and more data at its disposal than the conscious mind. Thus the author claims that common-sense decisions are more valuable. There appears to be a certain incompatibility between conscious reason and common sense and it is necessary to forget things in order to make them available to the subconscious. Because the business man forgets much of his former schooling his "business instinct" is improved. Scholars and experts do not forget so readily and are therefore not successful in business! The reviewer is unable to follow this argument which is based largely on personal observations and anecdotes.

The author suggests that it is undesirable to learn foreign languages in educating one's self for business. The justification for this sweeping statement is a remark, attributed to Bismarck, to the effect that a certain man who could speak seven languages ought to become a hotel porter. He presents

a most bizarre type of formal discipline which makes it desirable to get the student to do with energy what he does not do with interest, and suggests that boys leave school, at the age of fifteen or sixteen, to go into business.

The foregoing statements give some indication of the loose and absurd treatment of this topic of common sense. The writer admittedly is not a psychologist; yet he has no misgivings about his ability to discuss such technical subjects and to hazard sweeping educational theories on the basis of a few personal observations. The book presents no scientific data except in the last chapter on the Quakers. The treatment is, for the most part, qualitative rather than quantitative; the terminology is vague and unscientific. It seems doubtful that the writer has consulted literature on the alleged subconscious or on the scientific study of formal discipline and allied subjects.

The sole value of the book is that it shows what happens when an individual tries to go deeply into a field in which he has very limited experience and no scientific training. It is unfortunate that books of this sort are put on the market, but perhaps no serious harm will be done because those who would be in a position to adopt the abortive educational theories presented would know better any way. It does involve a regrettable waste of effort on the part of the writer and any who may chance to spend their time reading the book.

HAROLD E. BURTT

Ohio State University

GIST, ARTHUR S. *Elementary School Supervision.* New York, Scribner's Sons, 1926. 308 pp.

Excellent books have already appeared which deal with certain phases of supervision. Each book reveals the particular experience of its writer; one was written from the viewpoint of a director of teacher training; another was a scientific study of the value of supervision as revealed by an experiment carried on with a group of rural schools; still another revealed the problem through the eyes of the superintendent of a city system. All of the books published, however, overlooked the supervisory function and possibility of the building principal in a city system. It remained for Arthur S. Gist, principal of the B. F. Day School of Seattle, Washington, to make this contribution to the literature of supervision.

This book reveals the supervisory practices of a live, enthusiastic, elementary-school principal. It gives abundant evidence of broad and discriminating reading of current literature and a commendable knowledge of the best books dealing with supervisory problems and practices. It also shows that the writer has been very effective in capitalizing the abilities of his faculty and generous in his recognition of all who aided in his work.

The book consists of sixteen chapters which cover approximately three hundred pages. The first half of the chapters takes up the more general phases of supervision, such as the technique and art of supervision, study habits, marking of pupils, and the rating of teachers, while the other half of the chapters discusses the supervision of the various elementary-school subjects.

The book is a worth-while addition to the literature on supervision and would be a valuable instrument in the hands of a principal of an elementary school or a general supervisor of elementary instruction.

MARVIN S. PITTMAN

Michigan State Normal College

Publications Received, August 15 to September 15

Anthony, K. M. *A manual for observation and teaching in the elementary grades.* Baltimore, Warwick & York, 1926. 69 pp. $1.04.

Averill, L. A. *Educational hygiene.* Boston, Houghton Mifflin, 1926. 546 pp. $2.60.

Barrows, S. T., and Cordts, A. D. *The teacher's book of phonetics.* Boston, Ginn, 1926. 198 pp. $1.40.

Bean, E. L. *Daily helps and suggestions for teachers of first and second grades.* New York, Educational Pub. Co., 1926. 249 pp. $1.40.

Bennett, C. A. *History of manual and industrial education up to 1870.* Peoria, Ill., Manual Arts Press, 1926. 461 pp. $3.50.

Bennett, G. V. *The junior high school.* Rev. ed. Baltimore, Warwick & York, 1926. 225 pp. $1.68.

Beveridge, J. H., and others. *English for use.* Philadelphia, Winston, 1926. Book 3. 450 pp. $.66.

Bond, O. F. *An introduction to the study of French.* Chicago, Univ. of Chicago Press, 1926. 116 pp. $1.00.

Briggs, T. H. *Curriculum problems.* New York, Macmillan, 1926. 138 pp. $1.00.

Brooks, Amy. *What Rosalie Dare won.* Boston, Lothrop, Lee, 1926. 244 pp. $1.25.

Buchholz, H. E. *U. S.; a second study in democracy.* Baltimore, Warwick & York, 1926. 400 pp. $2.30.

Bugbee, L. M., and others. *An exploratory course in general language.* Chicago, Sanborn, 1926. 258 pp. $1.24.

Columbia University. Teachers College. International Institute. *A survey of the public educational system of Porto Rico.* New York, Teachers College, Columbia Univ., 1926. 453 pp. (Studies of the International Institute of Teachers College, Columbia University, no. 8) $5.00.

Cook, W. A. *High school administration.* Baltimore, Warwick & York, 1926. 378 pp. $2.10.

Hertzman, Anna-Mia. *When I was a girl in Sweden.* Boston, Lothrop, Lee, 1926. 158 pp. $1.25.

Highton, A. H. *Practical proofreading.* Chicago, United Typothetae of America, 1926. 213 pp. $4.15.

Hillas, Marjorie, and Knighton, Marian. *Athletic dances and simple clogs.* New York, A. S. Barnes, 1926. 54 pp. $2.00.

Huyke, J. B. *La sentimental; comedia en dos actos.* San Juan, P. R., Department of Education, 1926. 55 pp.

Jones, T. J. *Four essentials of education.* New York, Scribner, 1926. 188 pp. $1.50.

Laird, C. L., and others. *Everyday English.* Chicago, Row Peterson, 1926. 506 pp. $1.40.

Meyer, H. D. *A handbook of extra-curricular activities in the high school; especially adapted to the needs of the small high school.* New York, A. S. Barnes, 1926. 402 pp. $4.00.

Murphy, Marguerite. *Patricia and the other girls.* Boston, Lothrop, Lee, 1926. 320 pp. $1.50.

Packard, L. O., and Sinnott, C. P. *Nations as neighbors; a textbook in geography for junior high schools and for classes of corresponding grades.* New York, Macmillan, 1926. 579 pp. $2.00.

Patch, E. M. *First lessons in nature study.* New York, Macmillan, 1926. 287 pp. $1.50.

Payne, E. G., and Gebhart, J. C. *Method and measurement of health education; an experiment in public school 106, Manhattan, New York City.* New York, New York Association for Improving the Condition of the Poor, 1926. 43 pp.

Perkins, L. F. *The American twins of 1812.* Chicago, Houghton Mifflin, 1925. 195 pp. $.88.

Pratt, Caroline, and Stanton, Jessie. *Before books.* New York, Adelphi Co., 1926. 347 pp. $2.00.

Selvidge, R. W., and Allton, J. M. *Blacksmithing; a manual for use in school and shop.* Peoria, Ill., Manual Arts Press, 1925. 156 pp. $1.20.

Serl, Emma. *Everyday doings at home; a courtesy reader.* New York, Silver, Burdett, 1926. 128 pp. $.68.

Smith, Mrs. Chetwood. *History's most famous words.* Boston, Lothrop, Lee, 1926. 400 pp. $2.50.

Strasheim, J. J. *A new method of mental testing.* Baltimore, Warwick & York, 1926. 158 pp. $1.88.

Stratemeyer, F. B., and Bruner, H. B. *Rating elementary school courses of study; a report of the results secured from rating nine thousand elementary school courses of study.* New York, Teachers College, Columbia Univ., 1926. 193 pp. $1.50.

Taintor, S. A. *Training for secretarial practice.* New 2d ed. New York, McGraw-Hill, 1926. 320 pp. $2.50.

Terry, P. W. *Extra-curricular activities in the junior high school.* Baltimore, Warwick & York, 1926. 122 pp. $1.68.

Thompson, Edward. ed. *The Augustan books of poetry.* New York, Stokes, n.d. Rabindranath Tagore. 30 pp. John Keats. 31 pp. Robert Bridges. 29 pp. Percy Bysshe Shelley. 31 pp. G. K. Chesterton. 30 pp. Hilaire Belloc. 30 pp. $.25 each.

Tustison, F. E. *Job sheets in home mechanics.* Milwaukee, Wis., Bruce Pub. Co., 1926. Set no. 2. $.52.

Warner, G. C. *Good Americans; first lessons for the littlest ones.* New York, Educational Pub. Co., 1926. 93 pp. $.75.

Wells, R. F. *On land and sea with Caesar, or following the eagles.* Boston, Lothrop, Lee, 1926. 326 pp. $1.50.

News Items and Communications

This department will contain news items regarding research workers and their activities. It will also serve as a clearing house for more formal communications on similar topics, preferably of not more than five hundred words. These communications will be printed over the signatures of the authors. Address all correspondence concerning this department to Doctor E. J. Ashbaugh, Ohio State University, Columbus, Ohio.

The Bureau of Educational Research at Indiana University has issued a bibliography on school budgets, prepared by H. F. Clark and D. E. Gorseline. The bibliography is cross-indexed under thirty-two subheadings.

Dr. Harold F. Clark, associate professor of education administration, Indiana University, is on leave of absence during the year 1926-27. He is planning to study at the London School of Economics.

The Bureau of Research of Baltimore Public Schools has recently issued a monograph entitled the *Improvement in the Teaching of Reading*. Thirty-six articles by leading authorities in this field are included. The introduction is written by Miss Grace Kramer, research assistant of the Bureau.

Dr. John L. Stenquist, director of research, Baltimore public schools and a member of the faculty of the College for Teachers, Johns Hopkins University, taught in the University of California during the past summer. He reports that research among the western school administrators has advanced beyond the mere testing stage.

Four years of experimentation in student loans are reviewed in the Annual Report of the Harmon Foundation in New York City. Among the significant conclusions are:

Of 357 borrowers only 2 have failed to meet their obligation and no one has repudiated it. On the other hand, very few of the borrowers, although inherently honest, have been trained to any careful observance of the financial obligation. Though the installments are due on the first of the month, many of the borrowers seem to feel that they are in good standing if they get their checks in by the fifteenth, thirtieth, or even early in the following month.

Dr. E. E. Lewis, superintendent of schools in Flint, Michigan, has been appointed Head of the Department of School of Administration at Ohio State University. Dr. Lewis brings to his new position the training and experience of seven years of college work at the State University of Iowa followed by six years of public-school administration in Rockford, Illinois, and Flint, Michigan.

Dr. F. R. Rogers, who was a member of the faculty of the Michigan State Normal School at Kalamazoo this past year, has joined the State Department of New York.

The Public School Publishing Company has announced the Third Annual Nation-wide Testing Survey. The projects this year include civics, arithmetic, letter-writing, and handwriting. The value of these surveys has been demonstrated in the past and a large number of schools will without doubt participate in this one.

A new magazine for school use appeared in September. It is called *Current Literature*, and is published by the Looseleaf Education, Inc., New York. It is a four-page weekly for high-school students, intended to indicate the outstanding features in certain periodicals each month with direct contributions from eminent writers in the field. In theory it is to supplement the textbook by bringing the most recent literature directly to the attention of the student.

Tests in Stenography and Typewriting

E. E. Keener of the Department of Educational Research of the Chicago Public Schools is responsible for bringing to our attention an interesting result obtained in the testing of students in stenography and typewriting. Mr. William Bachrach, director of continuation schools and supervisor of commercial work at Chicago, reports that he divided two classes, each consisting of thirty students, and each taught by different teachers. The pupils whose names came in the first half of the alphabet were withdrawn from each class and tested on March 18, 1926, by means of a dictation test containing one hundred fifty words dictated at the rate of fifty words a minute. These pupils were required to transcribe their notes on the typewriter. Only those papers were counted which were perfect in transcription. These two half-classes scored 6.7 percent perfect in this transcription work.

Continuing, Mr. Bachrach says:

> On May 21, 1926, I re-tested the same group with a similar test and obtained a score of 50 percent perfect, or an increase of about 43 percent. At the same time I tested the two remaining halves of the two classes with the same test as was given their classmates on this day. They had been receiving the same class instruction previous to the first test on March 18, 1926, and in the interim up to May 21, 1926. When their test was graded they secured only 7 percent perfect transcription, or practically the same score as their classmates had secured two months previously.
>
> To check this peculiar result further, I tested another full class taught by one of the two teachers and they scored only 14 percent perfect, although they were considered a rather superior group. I tried this experiment in several other schools and found that the tested groups of the same grade always scored considerably higher than the groups which I had not tested of the same grade. From this limited experiment it would seem that in addition to having value from the standpoint of ascertaining progress, tests have an additional educational value in stimulating progress.

Projects in Educational Measurements

During the year 1925-26, the Educational Measurements Bureau, State Department of Education, Albany, New York, has worked on the following projects, some of which are completed while others are still being carried on:

1. Ability grouping in junior and senior high schools. The purpose of the study was to investigate the situation in New York at the present time. In general it can be said that many high schools hesitated to put such a system of organization into effect because of administrative difficulties. On the other hand, there was general agreement that such a system was advantageous to individual pupils.

2. Curriculum modifications for ability groups. Approximately sixty teachers assisted the Bureau in this study by suggesting the content of courses for the various ability groups, and methods of teaching most applicable to the groups. Each cooperating teacher divided her class into three sections on the basis of intelligence tests. Weekly reports were sent to the Bureau indicating textbooks used, pages studied, and methods of teaching found to be successful as well as those found unfavorable in each of the ability groups.

3. A study of the relative efficiency of the new type (objective) examination and the old type (essay) examination. Interest in this project arose from a desire to use the new type of questions in regents' examinations. The conclusions drawn from the data at hand were not sufficient to warrant a change from the old type of examination. More work must be done in this field.

4. During the spring of 1926 the supervisor of mathematics cooperated with the Bureau in an arithmetic survey of the rural schools and villages of New York State. In general it was found that the rural schools were doing relatively better work in arithmetical computation than the village schools, but they were inferior in arithmetical reasoning.

5. A survey of the practice departments of the New York state normal schools was started in the fall of 1925 by a study of age-grade and grade-progress. It will be continued in the fall of 1926 by the use of standardized tests. It is proposed to make this survey continuous over a number of years. The work thus far shows practice to be somewhat divergent.

6. In cooperation with the supervisor of Latin, the Bureau constructed a Latin test covering the first semester of the first year's work on the basis of the New York syllabus in this subject. The tests were given near the end of the first semester to a representative group of New York high-school pupils. A report based upon the result of this test is now being prepared.

7. A psychologist has been called upon to study reading situations in primary grades where pupils were failing to gain facility in reading. In order to carry on the work effectively, it has been found necessary to construct a prognosis test of reading ability. Work on this test has been started.

The Need of Psychology for Music Teachers

Few subjects in the curricula of teachers' colleges require the use of psychology more than does music. The music teacher deals with developing pupils of various ages, and, therefore, has an even greater need for genetic psychology, child psychology, and child hygiene than has the classroom teacher. In addition to this, she should know rather thoroughly the physiology and hygiene of the throat and respiratory system. This will aid her to understand the quality of different voices, voice placement, the range of tone, and the care of the voice. It will also be useful for a knowledge of phonetics and proper enunciation as well as for an understanding of the principles of correct breathing.

The psychology of sound is naturally of extreme importance for the teaching of this subject. The music teacher should know the anatomy of the ear; be acquainted with the various theories of sound; be informed as to the comparative acuity and range of hearing in men and women; understand sex differences in the quality of the voice and changes that take place with age; and be able to give tests of hearing to individual pupils. Moreover, she should know that as the deficiency of monotones is due to lack of motor control rather than to inadequate auditory discrimination, the condition can be improved.

In connection with genetic psychology, a study of the evolution of music is valuable. The study of the development of music among different peoples shows the connection between musical expression and culture and explains certain racial tendencies in music. Prevailing moods of different races or peoples produce different types of music. The stirring music of the Phrygians and the Scots expresses a different temperament than does the soft, sad music of the Dorians and the weird music of the Norwegians. The part that music played among the Greeks and its influence upon the soul, as told in Plato's "Republic," should interest the teacher.

Closely connected with this is the development of different musical instruments to express the temper of different peoples—the harps of the Egyptians; the harps and horns of the Assyrians; the drums and the *kin*, (primitive guitar), and *king* (struck by mallets) of the Chinese; the lyres and the flutes, ancestors of the oboes, among the Greeks; the trumpets of the Hebrews; the viols and *el oud* (lutes) of the Arabs; the cellos and violins among the Italians of the Renaissance; the organ, from the pipes of the Greeks and Egyptians to the elaborate instruments of today; the psaltery, developing into the spinet and harpsichord; the dulcimer of the Assyrians, developing into the clavichord; and the piano, developing from the time of Bach to Beethoven and through the nineteenth century. Allied to this is the evolution of different forms of music: the folk song, the dance, the motet, the masque, the oratorio, the opera, and such forms as the sonata, concerto, chamber music, and the symphony. The tendencies of peoples expressed in this way are important criteria for judging their character. Of all these forms of music, the folk song is perhaps the most important because it best expresses the human soul.

The immediate application of psychology to music is the theme of a book by E. F. Bartholomew entitled *Relation of Psychology to Music*. Here the whole subject of psychology is treated from the point of view of music.

Perhaps the most complete study of the psychology of music is that of Carl Seashore of the University of Iowa. He has extensive laboratory equipment for the detailed study of the subject. After several days of careful testing in his laboratory he can measure accurately the musical talent of the person examined. He has embodied his results in a book entitled *The Psychology of Musical Talent*. In this work he reduces the essential elements of musical ability to the senses of pitch, intensity, time, consonance, and to musical memory and imagery. From these experiments he has devised his musical-talent tests, which can be given in a comparatively short time on the phonograph to a group of pupils. These devices test fairly accurately the first five of these phases of musical ability. Musical imagery must be measured by an individual questionnaire. As a measure of musical ability, as an inspiration to musical study, and as an aid to vocational guidance, the music teacher will find these tests a great aid in her work.

MARVIN F. BEESON

State Teachers College, San Diego, California

Efficiency of Place Geography

The department of research of the West Allis public schools in consultation with the principals of the elementary schools, arranged a list of minimum essentials in place geography. This list, based on the research studies of Whitbeck, Bagley, and Branom and Reavis was considered in the light of the geography textbooks[1] in use in West Allis. The 175 items selected, were graded according to the course of study. This placed 57 items in grade IV-A, 79 in V-B, and 39 in V-A.

On the basis of this graded list of minimum essentials the department constructed an objective test of the completion type. Location was called for by country, continent, or state, as was deemed best. In a few instances, however, the location of the place was called for by "country nearest which" or "countries between which." About one thousand six hundred children in the schools were tested on January 7, 1925. Uniform conditions were maintained, and all tests were scored according to a key sent out by the department. The prime purpose in conducting the investigation was to discover the amount of "hold over" from grade to grade. For example, does the child in V-A know the few basic facts that the teacher presumes he knows when he reaches her grade?

The results obtained in the V-B part of the total test illustrate very well the general situation discovered. This test was given to all grades from V-B to VII-A. It must be remembered that, according to our course of study, the information called for in the total test is first completed in the V-A grade, and the work from VI-B to VII-A constitutes merely a repetition. Of the V-B material in this test, 64 percent is repeated in VII-B, and 31 percent in VII-A, while only 2 percent is repeated in VI-B and 3 percent in VI-A.

---

[1] Brigham, A. P., and McFarlane, C. T. *Essentials of Geography*. New York, American Book Company, 1921. 198 pp.

Compare these facts with the achievement discovered. Using percentage scores derived from median scores as representing grade achievement, the results ran as follows: V-B, 39; V-A, 39; VI-B, 43; VI-A, 53; VII-B, 52; and VII-A, 60. The VI-B and VI-A grades are higher than V-B where practically none of the material was repeated. On the other hand, VII-B, where 64 percent of the material was repeated, shows no gain, and VII-A, where the remaining 34 percent of the material was repeated, shows only a 7 percent gain.

This illustration reveals the general situation discovered. The increase in geographical information is not dependent upon direct geography teaching; there is little "hold over" from grade to grade; and repetition of material in place geography is practically valueless. The last fact, which seems significant to the writer, was further emphasized by the repetition of the test in May, 1925.

As a result of the test in January, the teachers in all grades gave a five-minute drill on this list every day and were "conscious" of the items in the list while presenting the regular geography work. The test in May shows, as was expected, great improvement; but the most significant fact discovered was relative to the value of the repetition of material.

The authors of the textbook used state that the method of approach is essentially different in Books I and II. In Book I, geography is approached as a story, while in Book II, causal relationships are stressed. It would seem that if these basic facts are not only re-taught, but re-taught through principles and relationships, the second teaching should fix them more securely than the first. Was this the result? Take an illustration again from the V-B test: 82 percent of the material is known in VI-B, 89 percent in VI-A, 82 percent in VII-B, and 76 percent in VII-A. Here we find again the same general situation—namely, that grade VI-B where the least material was repeated shows the highest percent of retention, while grade VII-A where all the material was repeated shows the smallest percentage of material retained.

Retention, therefore, seems to vary inversely with the amount of repetition. The only conclusion possible from both studies is that there is practically no relationship between retention and repetition. The time spent in repetition seems wasted. The significance of this fact, if the results represent a real situation and hold true for other subjects, may affect the whole program of elementary education where repetition of subject-matter from grade to grade has been the accepted method of procedure.

H. B. NASH

Director of Research, West Allis, Wisconsin

Supervision of Instruction

The principals of one township in North Carolina have attempted to answer the challenge that principals give little or no time to supervision of instruction. The principals of five elementary schools, one junior high, and one senior high school, cooperatively agreed on the following outline of duties and kept a check on their time for a period of two months. The results, which were published in the *North Carolina Teacher*, September, 1925, showed that approximately

38 percent of the principal's time was given to administration, 29 percent to supervision, and 10 percent to clerical work. The remainder was distributed between community leadership and professional study. On the basis of this experience, these principals decided that more administrative duties could be delegated and a larger amount of their time given to supervision, which they are accepting as their fundamental duty. The outline is given here in the hope that other principals may check on their own time and thus come to appreciate more definitely where their minutes go.

A. Supervision of Instruction
- I. Observation
  - 1. Preparation for visitation
  - 2. Visitation
  - 3. Study dealing with visitation
  - 4. Conference on visitation
- II. Teachers' Conferences
  - 1. Individual
  - 2. Group
  - 3. General
  - 4. Principals
- III. Testing
  - 1. Giving tests
  - 2. Scoring
  - 3. Recording
  - 4. Interpretation
  - 5. Follow-up work
- IV. Teaching
  - 1. Demonstration
    - a. Preparation for
    - b. Actual teaching
    - c. Discussion
  - 2. Experimental
    - a. Preparation for
    - b. Actual teaching
    - c. Discussion
  - 3. Regular class work
- V. Adapting Course of Study
  - 1. Gathering materials
  - 2. Filing materials
  - 3. Organization of materials
  - 4. Explaining of teachers
- VI. Visits of Supervisors
- VII. Exhibits and Bulletin Boards

B. Administration
- I. Equipment and Supplies
  - 1. Requisitions for
  - 2. Checking as received
  - 3. Issuing to teachers
  - 4. Collecting book fees
- II. Placing Pupils
  - 1. Classifying new pupils
  - 2. Transfers
  - 3. Promotions
- III. Schedules

IV. Daily Routine
1. Care of building and grounds
2. Management of pupils
a. On playground
b. Before and after school
c. General and special discipline
d. Absences and tardiness
e. In cafeteria
f. First-aid
3. Organization
4. Assembly
5. Telephone
6. Lunch

V. Extra-Curricular Activities
1. Athletics
2. School enterprises and activities
3. Fire drills
4. Graduation exercises
5. School paper
6. Conferences with parents and callers
7. Visits of nurses

C. Community Leadership
I. Visitation of Parents
II. Civic Activities
III. Parent-Teacher Associations

D. Clerical Work
I. Reports
1. Teachers
2. Superintendent
3. Pupils
4. Attendance officer
5. Welfare officer

II. Records
1. Time budget
2. Pupils
3. Permanent

III. Correspondence
IV. Tuition

E. Professional Study